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AMERICAN JOURNAL OF ORTHODONTICS

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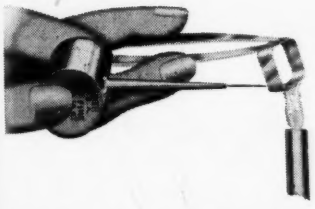

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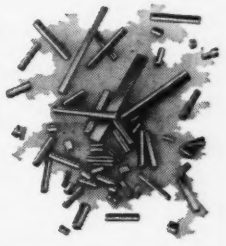

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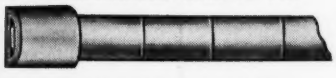

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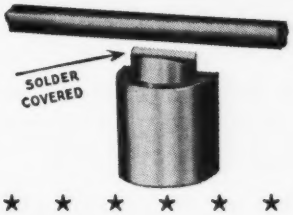

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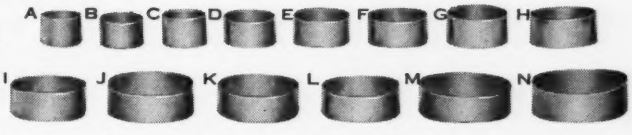

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American Journal

of

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VOL. 46 MARCH, 1960 No. 3

Original Articles

PRESIDENT'S ADDRESS, SOUTHWESTERN SOCIETY OF ORTHODONTISTS

MARCUS D. MURPHEY, D.D.S., HOUSTON, TEXAS

THE Houston members of the Southwestern Society of Orthodontists and I welcome you to Houston for this thirty-ninth annual session. We hope that you will all enjoy your stay in Houston, the fourth in nine years, and that the knowledge gained from the excellent scientific session to be presented will be rewarding.

I would like to pay tribute to one of our beloved and respected members, Guy M. Gillespie, of Abilene, Texas, a past-president of the Southwestern Society, who died in October, 1958, and to our ever-present guest and friend of the Southwestern Society, Arch Brusse, of Denver, Colorado, a past-president of the Rocky Mountain Society and the American Association of Orthodontists, who died in May, 1959. Guy and Arch gave freely and unselfishly of their time and efforts to orthodontics and to dentistry, and their presence at our meetings will be sorely missed. Suitable resolutions and certificates have been prepared for presentation to their families in memory of their contributions to the Southwestern Society.

I wish to express my appreciation to Robert M. Ricketts, who is with us for the second consecutive year, and to Morris M. Stoner and Harold S. Born for their willingness to participate in our program and for the time and effort they have contributed to impart to us a portion of their vast knowledge of orthodontics. The planning and preparation of the program was the task of Program Chairman Bibb Ballard and his Program Committee, to whom I wish to extend my thanks for their splendid efforts. I also wish to extend my appreciation and sincere thanks to W. J. Schoverling and Ott L. Voigt and their Local Arrangements Committee for the vast amount of time and work they have given to make this meeting an enjoyable and successful one. To the Board of

Presented before the Southwestern Society of Orthodontists in Houston, Texas, Oct. 5, 1959.

Directors, to the elected and appointed committees, and to our secretary, Harold S. Born, I wish to extend my thanks for their advice and guidance.

The increase shown in the number of general clinics to be presented is certainly a healthy trend in the active participation that our members are showing in support of the program and the advancement of orthodontics. To these men and to General Chairman Claude Phillips and his committee, I wish to extend my thanks for increasing the scope of the scientific session.

The Insurance Committee of the American Association of Orthodontists, with Nathan G. Gaston as chairman, has made an extensive study of the specific needs of the orthodontist for disability income insurance. They endeavored to learn which group accident and health policies were currently available. After studying this problem, they had a policy specifically designed which goes farther than any other in solving the problems of disability income insurance for our members. I urge each of you to support this program. For the benefit of those who have not participated, the administrators, Mr. Dan H. Treloar and Mr. Joseph F. Heisel, Jr., have agreed to extend the enrollment period from October 1 to the duration of this meeting. They will explain the workings of the program during this session and will be present in the commercial exhibits area for the duration of the meeting to answer any questions pertinent to the plan.

The efforts of past administrations and the efficient functioning of the various committees have certainly made my administration an easy and pleasant one. I recommend the continuance of the registration fee to defray the expenses of our meetings and suggest that this fee be fluctuant, depending on the locale of the meeting place, at the discretion of the Local Arrangements Committee, and approved by the Board of Directors ad interim upon submission of the report of the Chairman of Local Arrangements for the ensuing year.

In order to comply with the above recommendation, the By-Laws, Article XIII, section 18: Convention Planning Committee: Paragraph 1, should be changed to read: "Shall consist of the chairmen of the Local Arrangements Committees for the last two preceding annual meetings, the chairman of the Local Arrangements Committee for the current annual meeting, and the chairman of the Local Arrangements Committee for the ensuing annual session." I submit this recommendation to the Advisory Committee for its consideration.

I would also like to recommend that the Education Committee, whose duties are defined in the By-Laws, Article XIII, section 16, contact the deans of dental colleges conducting graduate orthodontic training for permission to request from the head of the orthodontic department syllabuses prepared for graduate orthodontic training for distribution of training material to senior and junior associates who are engaged in preceptor training and who have been approved by the Qualifications Committee, which would be responsible for the distribution of said syllabuses.

I am indeed honored in having had the privilege of serving as your president for this thirty-ninth annual session. I am even more honored that this session has occurred during the centennial celebration of our American Dental Association.

2017 West Gray.

FORCE CONTROL IN CLINICAL PRACTICE

I. An Analysis of Forces Currently Used in Orthodontic Practice and a Description of New Methods of Contouring Loops to Obtain Effective Control in All Three Planes of Space

Morris M. Stoner, D.D.S., M.S., Indianapolis, Ind.

ALL of us are very much aware of the influence of time and motion studies in industry, business, and professional practices. Anything that will save us time, without reducing our standards, is of obvious interest, for it will increase our efficiency and be of benefit to us and to our patients.

Attention has been focused on relocation of office equipment and furniture, repositioning of instruments, and movements of the operator and his personnel in dental and specialized practices. All of these considerations are important to the operator who wants to improve his practice; however, as much attention must be devoted to the treatment of a case with special consideration to the appliance adjustments as to the layout of the office if maximum efficiency is to be approached. The application of forces that are continuous in activity on as many areas of the denture as possible and working in the direction in which the teeth are to move, with maximum comfort to the patient, is a condition that fulfills the requirements of treatment efficiency.

Through the careful consideration of time and motion procedures in the management of the office personnel, in the handling of the patients, and in the treatment plan, the practice of orthodontics can be made much easier, allowing more cases to be treated in less time and with less effort.

This is the direction in which the profession has been moving gradually since the days of Fauchard, when cumbersome apparatus of uncertain engineering quality and a hit-and-miss chart of force values were the tools of the trade. Through the work of Angle, Case, Mershon, and others, the profession moved closer and closer to standardization of appliance designing, while the work of Schwartz, Oppenheim, and Stuteville threw additional light on force values and the effect of various forces on tooth movement.[1]

Recently, in Austria, Köle reported on a method of individually sectioning teeth and groups of teeth and repositioning them with their alveolar process to correct orthodontic abnormalities.[2] Perhaps this is the ultimate in treatment.

Presented before the Southwestern Society of Orthodontists, Houston, Texas, October, 1959, and the Great Lakes Society of Orthodontists, Cleveland, Ohio, November, 1959.

Naturally, we do not want to accept any revolutionary method until it has been proved many times, but at the same time neither do we want to put ourselves in the position of discounting rational changes in conventional treatment that might improve the efficiency of our operation.

During the course of these articles, it will become apparent that the use of multiple loops of varying designs greatly increases control of force, but it also will become apparent that there are certain inadequacies in the operational function of loops that complicate the treatment and require the use of more conventional design at certain stages of treatment.

My interest in the use of loops began in 1956 with the publication of an article by Begg.[3] In this article, Begg spoke of treating cases routinely in four to eight months. Such a report undoubtedly stirred the interest, if not the envy, of many in the field. It certainly made me wonder if there might be something in Begg's method that could be applied in my own practice. Let us consider parts of Begg's philosophy and technique, since it was his article that stimulated much of my initial experimentation.

Begg described "differential force" as a force great enough to move certain teeth but not great enough to move others. In his article, he refers to research evidence that minimum forces will move but one tooth if resisted by several teeth with the reciprocating force distributed among the so-called "resistance teeth." This anchorage area, he said, receives a lower pressure on the individual anchor teeth and will not move them at all. He added, however, that when a heavy pressure is placed in the same area, the reverse action occurs—the tooth that was moving originally stops moving and the anchor teeth begin moving. This particular contention proved fascinating, for it led to speculation concerning the optimum range of force values for tooth movement.

No matter what else might be said of the treatment plan and the exhibit of results, the fact remains that the cases Begg demonstrated, treated in accordance with his philosophy and technique, showed far more tooth movement than can be achieved with most conventional techniques in the same time.

An analysis of my practice seemed in order.

The first conclusion was that Begg was right. My current methods were not only slow and difficult but also hard on the patients. In a high percentage of my cases, the first application of an arch wire brought a complaint from patients of sore teeth that lasted for several days. In fact, the term "sore teeth" is so frequently heard in many of our offices that little attention is paid to it. However, Begg's article forced me to ask: "What is there about my current technique that produces pain?"

In all cases, treatment began with light round wires for leveling—arches about 0.018 inch in diameter. On the severely crowded or overelongated or depressed teeth, no attempt was made to obtain bracket engagement in the beginning. Still, many times the teeth got sore. The answer had to be that in many instances even an 0.018 inch wire used on the edgewise brackets exerted too great a force on some severely positioned teeth.

The application of the minimum force to move the teeth should be adopted right in the beginning. A straight arch wire, regardless of the size, will not

distribute equal force on all teeth. The more the wire is distended and the shorter the span between brackets, especially on the severely positioned teeth, the greater will be the force. Some method of reducing the force of the wires on certain teeth must be adopted at the outset.

This raised other questions: "What is the minimum amount of force required to move teeth?" "Is it the same for all teeth?" It is not likely that the force is the same for all teeth. It seems reasonable that the direction in which a tooth is to be moved, the density of the bone, and the size of the root in a given mouth determine the amount of force that will be needed.

A further analysis of my treatment procedures showed that many of my arch wire adjustments were limited. The adjustment was made, the teeth were moved, and then a waiting period occurred during which time the arch wire expended itself or perhaps took a set. Nothing happened until the next visit. Time was lost at least between the time the arch wire expended itself and the time the patient returned. At that time, the arch wire was reactivated, either by reshaping or by replacement with the next size of straight arch wire. This expended itself quickly, and more between-visit waste occurred.

The thought persisted that somewhere in Begg's article lay a solution to the three problems that plague many operators—pain, lack of continuity of force, and frictional resistance to tooth movement.

In his article, Begg demonstrated control of rotation, space opening and space closure through the formation of vertical loops in a single arch. He also produced torquing pressures on the anterior segment by contouring these loops to press against the gingival area of the teeth.

An effort was made to apply the procedures suggested by Begg to my own practice. One thing became apparent very quickly: The Begg technique was difficult, if not impossible, with the edgewise mechanism. Difficulty was encountered almost at once, because Begg used a ribbon arch wire bracket fastened by a staple or pin, while my treatment philosophy called for edgewise brackets fastened with ligature ties. I was very reluctant to abandon my strap-up method because of the positive control which rectangular wire offers over movement in later stages of treatment, especially at the finishing stages.

Although I spent many discouraging months experimenting in an effort to adopt this technique, the work was not in vain. Interesting side observations came out of the effort, and from these observations came a more thorough understanding of the forces produced by wire contoured in loops. A different treatment approach and philosophy have developed as a result. It is hoped that this will prove valuable in the biomechanical approach to treatment.

"FOUR D'S" OF FORCE CONTROL

To understand the development of this treatment philosophy, one must begin with an examination of some methods of obtaining effective force control.

When discussing force control, it is necessary to state explicitly just what is being controlled. Force control implies control of the *degree* of force, the *distribution* of force, the *direction* of force, and the *duration* of force—the "four D's" of force control. Degree refers to the intensity or amount of force; distribution to the manner in which force is transmitted to the root or alveolar

process (namely, as a tipping or bodily movement); direction to the plane in which the tooth is to move; and duration refers to the range of activity of the force.

It is comforting to stand at a classroom blackboard and draw illustrations showing a lever resting on the apex of a triangular fulcrum with controlled weight on one end and controlled force on the other. This is a useful method of demonstrating to students a principle of physics when describing the response of a tooth to force application. There is no danger in it so long as we do not begin to believe that this precision can be applied in clinical practice. Unfortunately, the placement of the band on the tooth, the bracket on the band, the tooth itself, the size of wire, and the contour of the wire do not duplicate this blackboard diagram except in the gross application of known factors of the laws of physics.

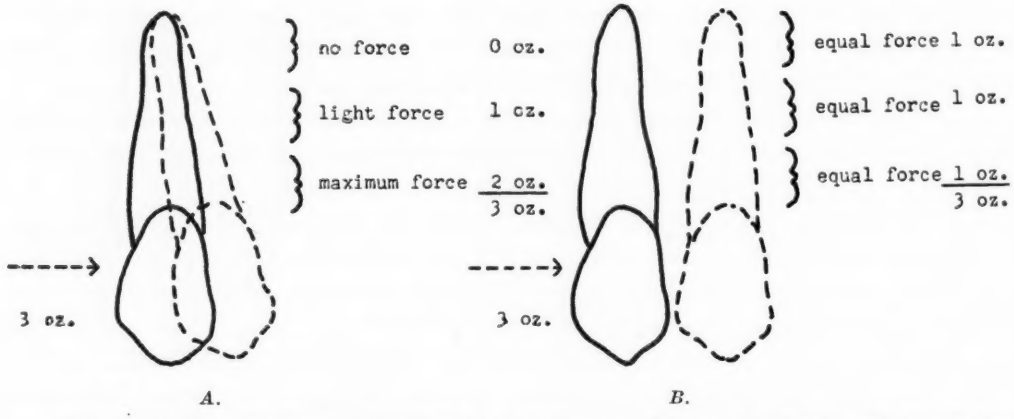


Fig. 1.—*A*, Tipping movement. If a total of 3 ounces of force is distributed to produce tipping movement, the greatest amount of force will be concentrated at the alveolar crest, as demonstrated in diagram 1.

B, Bodily movement. When this same force of 3 ounces is applied to produce bodily movement, there will be equal distribution over the entire root area and it will not be concentrated at any one point. This illustration demonstrates the distribution of force. Actually, to obtain a bodily movement, two to three times the force required for the tipping movement would be required to obtain equivalent light force along the entire root surface.

But the picture is not quite so bleak. We do know that the ideal treatment calls for moving a tooth or teeth as rapidly as possible with as little damage as possible to periodontal tissue, and we hold to the theory that this is most efficiently accomplished through the proper application of optimum force. Above this range, the forces will be so great that the tissues will be crushed, causing necrosis and cessation of normal physiologic activity; below this range, the forces will produce little or no tooth movement or movement that is too slow for clinical consideration.

Another extremely important fact to consider with reference to optimum force is that a known force value that is optimum in one type of movement can be ineffective or traumatic in another type of movement (Fig. 1). For example, the optimum force that will move a tooth bodily may become a traumatic force if employed to tip a tooth. In the bodily movement the force would be distributed relatively evenly along the entire root area, while in a

tipping movement the force would be concentrated at the alveolar crest area, diminishing in intensity as it approached the apex. On the other hand, a force which would be optimum in tipping a tooth would be very inefficient if used to move a tooth bodily. Although this may seem elementary, it is very important that the operator consider its implications before planning any tooth movement.

In speaking of optimum force, reference is made to the degree or intensity, and the operator must always be aware of the manner in which it is distributed. If control can be established over the amount of force so that it is optimum, control is established over the first of the "four D's"—the degree. If this force is applied with precise control so that it is distributed to have optimum intensity according to the type of movement that is desired, then control is established over the second of the "four D's"—the distribution. These two factors are interrelated.

Very little scientific data are available concerning the amount of force required to move teeth. As little as 20 grams per square centimeter and as much as several pounds have been tested on certain appliances in common use today. Storey and Smith[4] have suggested that efficient movement of canines will occur somewhere between 180 and 250 grams of force and that molars will move mesially with a force of over 300 grams. My personal experience seems to favor forces of 2 to 6 ounces, depending on the situation. Much investigation is needed to establish force standards to serve as a useful guide. Recognition must always be given the fact that, because of appliance inefficiency, sometimes applied force is dissipated by friction or improper application and it is difficult both to control and to determine the amount of force that is being received by the individual tooth.

Great care also must be taken in analyzing the directional effect of any force to avoid those side vectors of force which could produce unwanted expansion, elongation, or other undesirable tooth movements. Directional control is the third of the "four D's."

Much has been written in the past several years concerning continuous versus intermittent force. My clinical experience has tended to substantiate the efficacy of properly applied continuous force. Thus, in considering control of duration—the last of the "four D's"—my goal is to develop forces that will act over as long a range as possible to permit continuous tooth movement between visits without the adjustment expending itself. Again, this is dependent on the proper application of forces of optimum intensity. It can readily be seen that these factors, the "four D's," are interrelated.

MECHANICAL MEANS OF DEVELOPING FORCE

For simplicity, orthodontic forces may be divided into primary and secondary. Primary forces are developed in the arch wire and depend on the resiliency or movement of the arch wire. Secondary forces are those derived from such auxiliary attachments as finger springs, coil springs, rubber bands, headgear, and other devices.

The resiliency of a semirigid or so-called heavy arch wire, as well as the lighter-gauge wires, may be increased by incorporating various loop designs. While the use of secondary forces can be just as important as the use of

Fig. 2.

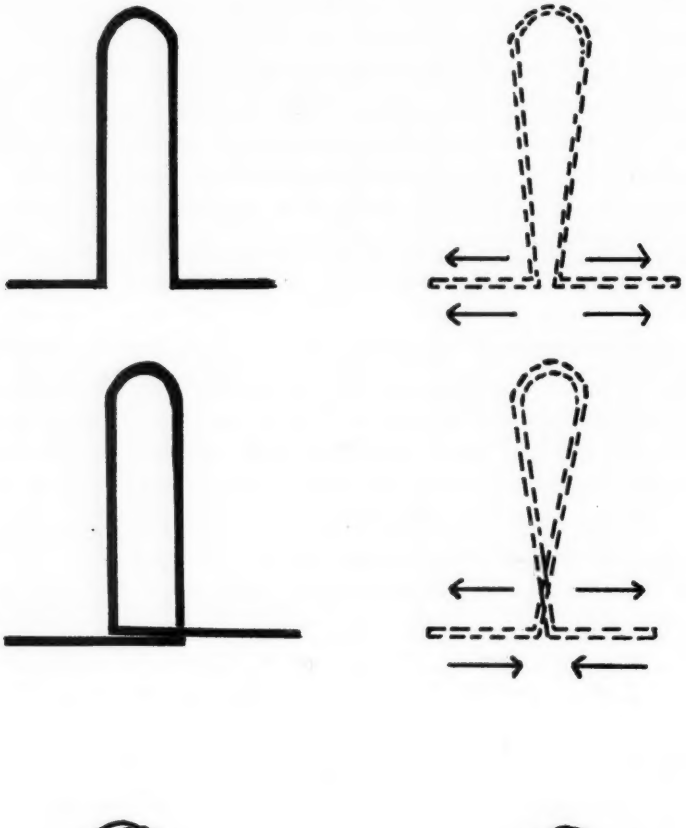


Fig. 3.

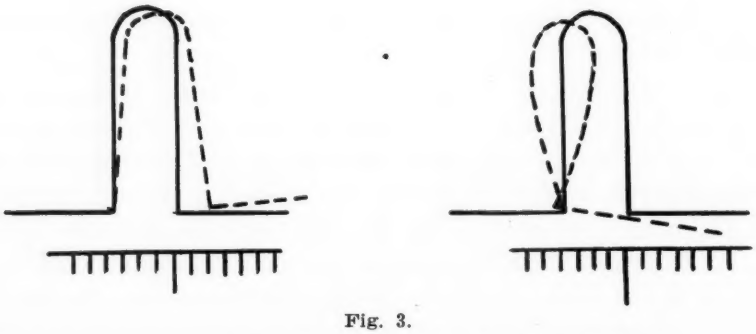


Fig. 2.—*A*, An open or continuous loop. *B*, A closed or reversed loop.

Fig. 3.—Extending and compressing legs of a vertical loop. Scale shows that maximum deflection without a permanent set of a vertical loop when activated by extension is approximately one-half that permitted when the same loop is activated by compressing the legs.

primary forces, this first article will concentrate on the development of primary force in the arch wire through the use of loops. In the second article, illustrations will be given of clinical application of secondary forces in conjunction with loops.

There are some things that all loop designs have in common. The best way to understand the activity of any given loop is first to understand what broad rules apply to any deflection in wire. Therefore, before considering the various designs and their clinical application, let us list the functional factors which they have in common.

Possibly the most important fact to remember is that any loop automatically increases the length of the arch wire between the brackets, thereby increasing the range of activity and reducing the force.

The activity of a loop is dependent upon two types of force built up in the loop. One is the spring of the legs themselves which act as independent levers and may be activated in any direction. Another is the activity developed in the curvature at the apex of the loop. A loop may act as a rigid lever, taking a deflection at the apex, or it may act as an independent spring, depending upon the resiliency of the wire in the loop to give it activity. Usually, the action of any loop will depend upon a combination of the two.

Any loop may be contoured as an "open loop" or as a "closed loop" (Fig. 2). An open or continuous loop, when activated by compressing the legs, will tend to push the horizontal extensions apart, increasing the arch length. A closed or reverse loop, when activated by compressing the legs, will tend to draw the horizontal extensions toward each other, shortening the arch length. In addition to mesiodistal force, Strang[5] also described some tipping activity in the horizontal extensions at the base of the loops.

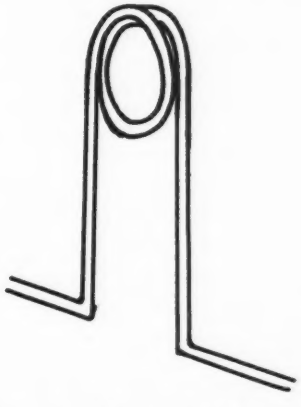


Fig. 4.—The helical loop. Presence of a helix or coil in any loop reduces forces considerably.

An important consideration with reference to the activity of any loop is that the range of activity is increased greatly when the loop is activated by compressing the legs rather than by extending the legs or pulling them apart (Fig. 3).

The force of any loop may be reduced by coiling the wire one or more times at the apex (Fig. 4). Such a loop has been designated as "helical," a term commonly used in industry and derived from the Greek word helix, meaning spiral. The helix or coiling of the wire may be incorporated in any loop and

acts mainly as a force-reducing agent. The coil does not alter in any way the directional activity, shape, or function of any loop, but, for the sake of standardization, the term "helical loop" may be accepted to mean any loop that has a helix at its apex.

In testing the force-reducing capacity of a 10 mm. helical loop (with a fixed-size coil), Lawless[6] found that the intensity of force was one-half that of similar nonhelical loops. This may vary somewhat with the size of the loop and the size of the coil, but, for clinical purposes, we can assume that a similarly great reduction in force will occur through the coiling of the wire at the apex of any given loop. The helical loops also exhibited a slight increase in range of activity. Lawless also compared the range of activity in these 10 mm. loops and concluded that compressing the legs virtually doubled the range as compared to opening the legs.

Before moving on to the use of the various designs of loops, I shall state briefly the general rules that will apply to any of them:

1. Any loop will reduce force and increase range.
2. Any loop may be contoured "open" or "closed."
3. Loops are most efficiently activated through compression of the legs.
4. The force of any loop may be reduced by coiling the wire at the apex one or more times.
5. The force reduction effected by contouring most loops will be in direct proportion to the increase in the amount of wire between the brackets.

Currently, in conventional edgewise procedures, the first arch wire placed in position is usually a straight 0.016 inch round wire or, more often, an 0.018 inch round wire. Because of the provoked interest in force values, an 0.016 inch round wire was tied into an edgewise typodont, and the intensity of force required to seat the wire in the brackets was tested. The test showed that a deflection as small as 1 mm. required almost 16 ounces of pressure.

That seemed like a great deal of force, so Begg's procedure was followed and vertical loops were contoured into the arch wire and tied into place with the loops on either side of the bracket. The loops reduced the force necessary to obtain bracket engagement between the same two teeth to 3 or 4 ounces.

A test of the force requirement in an occluso-gingival direction, however, disclosed that nearly 16 ounces of pressure again was required to obtain a 1 mm. deflection.

Why should force be reduced in only a labiolingual direction by a vertical loop? That question is answered by a basic law of physics: A spring lever (the legs of the loops) is active at right angles to its deflection and may not be deflected easily through its length. Steiner[7] examined this limitation, as well as the positive aspects of force values in vertical loops, in 1932.

While the law of physics governing levers cannot be repealed, it can be made to work in our favor; therefore, a loop was formed in such a manner that its active legs were parallel to the arch wire to effect force reduction in the

occlusogingival direction (Fig. 5). This loop contour was designated a horizontal loop. Incorporating a horizontal loop allows greater control over the direction of the force. More elaborate discussion of its activity will be given later in this article.

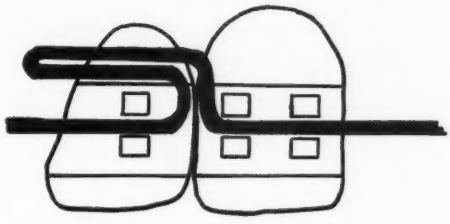


Fig. 5.—The horizontal loop. This loop develops its primary activity in the vertical plane. It is efficient primarily in facilitating bracket engagement and developing effective force for elevating and depressing teeth

LOOP DESIGNS

1. *Vertical Loop (Fig. 6).*—The single vertical loop may be either an open loop or a closed loop (see Fig. 3).

The single open vertical loop has its maximum efficiency when it is used to open space (Fig. 6, *B*). In such cases the arch wire is fixed to the brackets, the loop is activated by compressing the legs, and as the loop assumes its original position the teeth move apart. It can be used somewhat less effectively to close space where a short range of activity is permissible. Then it is activated by opening the legs (for example, the Bull loop).

The single open vertical loop also may be used to rotate a tooth (Fig. 6, *C*). By contouring a vertical loop in front of the lingually displaced area of the rotated tooth, the operator can obtain immediate bracket engagement. The increased resiliency created by deflection of the loop automatically creates a force of greater duration that works to rotate the tooth toward its desired position.

The single closed vertical loop is used primarily to close space (Fig. 6, *D*). It is activated by compressing the legs, and as the loop expends its force it draws the horizontal extensions of the arch wire together and moves the attached teeth with them. Because of the complexity of design and the overlapping of the arch wire which may cause bracket interference, there is no point in using a closed loop unless it is to close space.

A good way to remember the principal application of a vertical loop to obtain the maximum range of activity is this: An *open* vertical loop is selected to *open* space, and a *closed* vertical loop is used to *close* space.

2. *Double Vertical Loop (Fig. 7, A).*—The double vertical loop is contoured on either side of a given tooth, and it has two effective uses. One is to move a labially or lingually displaced tooth into line through the labiolingual spring quality inherent in the horizontal section between the two loops (Fig. 7, *B*). The other is to rotate a tooth. The loops are so contoured as to produce an expansion on one side of the tooth and a contraction on the other side, causing a reciprocal rotational activity on the brackets (Fig. 7, *C*).

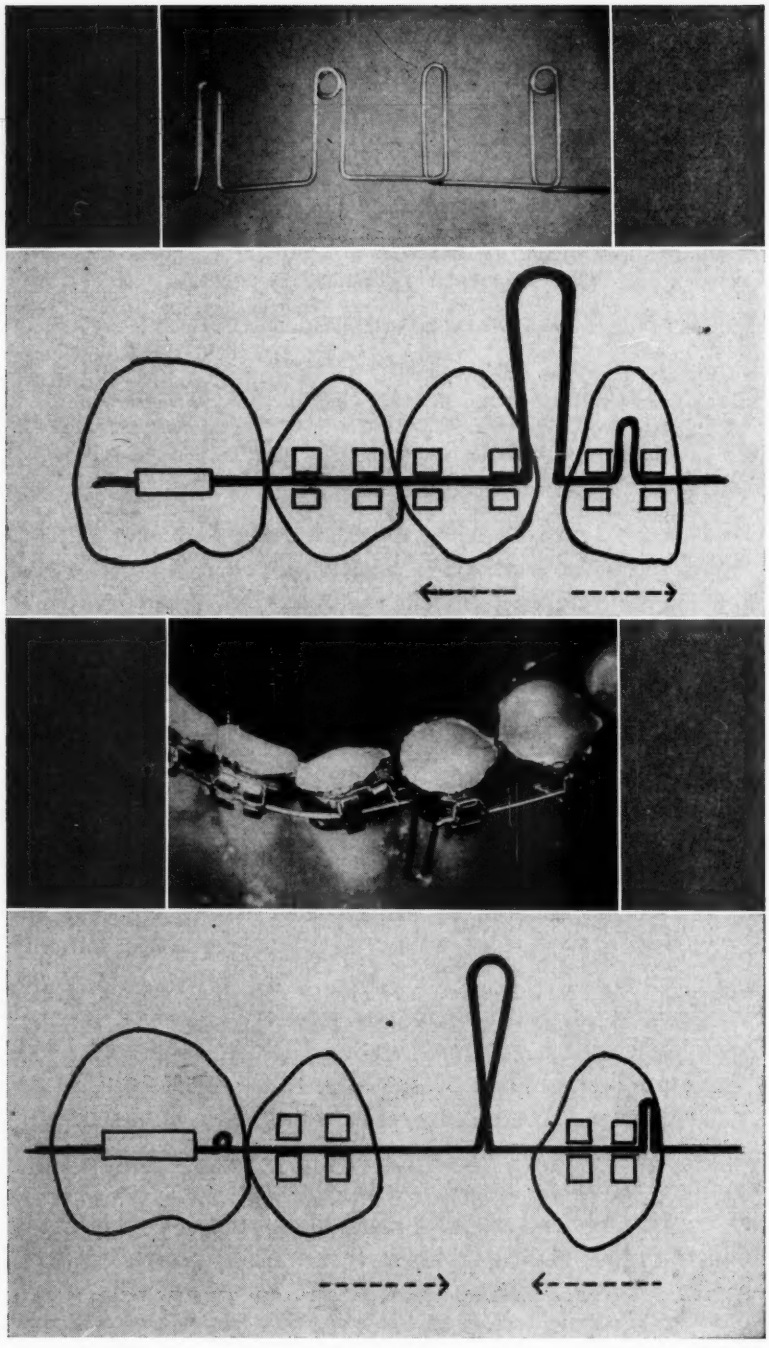


Fig. 6.—*A*, Vertical loop. *Left to right*: Open vertical, open vertical helical loop, closed vertical loop, and closed vertical helical loop.

B, Open vertical loop is selected to open space because of the greater range of activity developed by compression of legs as opposed to lower range by opening.

C, Open vertical loop to aid rotation.

D, Closed vertical loop is selected to close space because of the greater range of activity developed by compression of legs as opposed to lower range by closing.

Strang[8] and Downs[9] also describe the use of double vertical loops to move a tooth bodily in a mesial or distal direction. This is accomplished by fixing or stopping the intervening horizontal section to the brackets so that the arch wire cannot slide and then opening one loop and compressing the other so that the contraction and expansion of the loops will tend to move the tooth bodily in a mesial or distal direction.

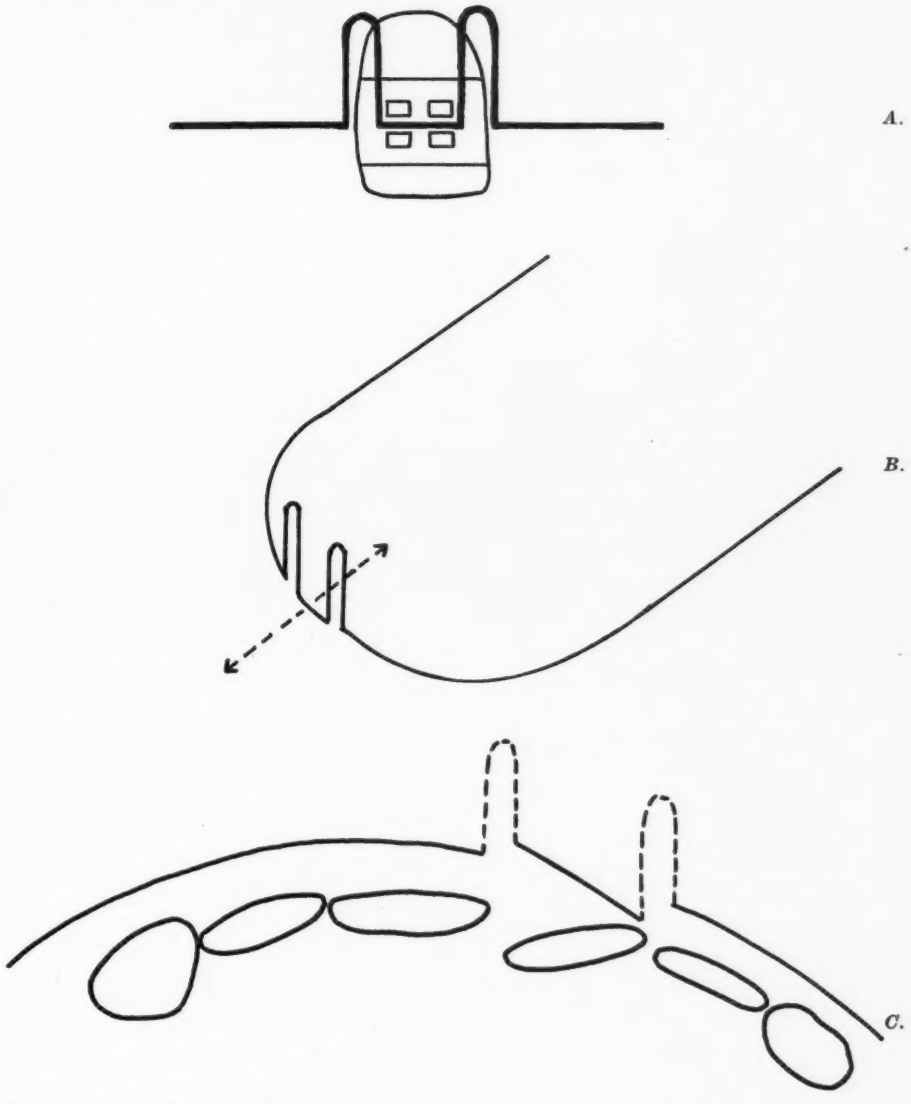


Fig. 7.—*A*, Double vertical loop.
B, Diagram of double vertical loop demonstrating increased resiliency in labiolingual directions.
C, Diagram (occlusal) showing inclination of horizontal section between two vertical loops to get maximum efficiency to rotate a tooth. Dotted lines represent vertical loops.

Since the arms of the loops cannot be deflected through their length, the double vertical loop has very little force-reduction value in its occlusogingival direction.

3. *"S" Loop (Fig. 8).*—The "S" loop is simply a modification of an open or closed vertical loop. It develops similar force activity without the undesirable occlusal or gingival thrusts sometimes exhibited by the vertical loop.

4. *Omega Loop (Fig. 9).*—The omega loop is a variation of the open vertical loop. It is shaped like the Greek letter for which it was named. It tends to distribute stresses more evenly through the curvature of the loop instead of concentrating the stresses at the apex, which may lead to breakage. It is used to give the last tooth in the arch a bodily root thrust.

Fig. 8.

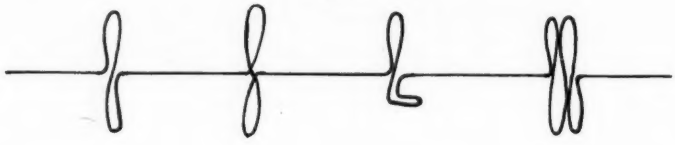


Fig. 9.

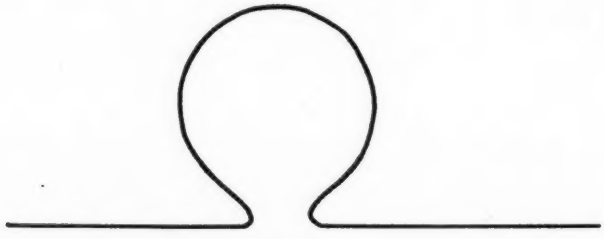


Fig. 8.—Several modifications of "S" loops. This design reduces the mesiodistal thrust without tipping teeth. Special bending affords attachment for elastics or headgear.
Fig. 9.—Omega loop.

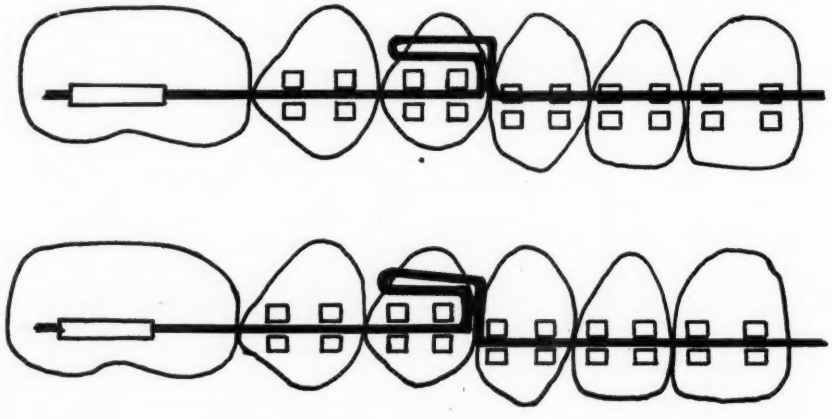


Fig. 10.—Horizontal loop.

5. *Horizontal Loop (Fig. 10; See Fig. 5).*—The horizontal loop's principal value is its reduction of force in the vertical plane or occlusogingival direction, permitting immediate bracket engagement in severely positioned teeth which the operator may want to elevate or depress.

It is very effective because of its efficiency in opening the bite and depressing or elevating the anterior or posterior segment and also because of the great

number of times that it can be employed in clinical practice. It permits immediate bracket engagement without excessive force on severely displaced groups of teeth or individual teeth.

Attention must be directed to the fact that, as with any loop, the most efficient range of activity is created when the legs of the loop are compressed. The operator can never miss on this important point if he will so contour the loop that its legs overlie the shorter tooth.

It is possible to contour the horizontal loop to press against the gingival area to develop a torquing activity on the root; however, clinical experience has not shown this to be very effective.

6. *Double Horizontal Loop (Fig. 11).*—The double horizontal loop is most efficient when working on an individual tooth above or below the line of occlusion. Considerable deflection can be obtained in the arch wire with immediate bracket engagement and continuous activity to draw a tooth into line. It can be activated in an occlusogingival and labiolingual plane but not in the mesiodistal plane.

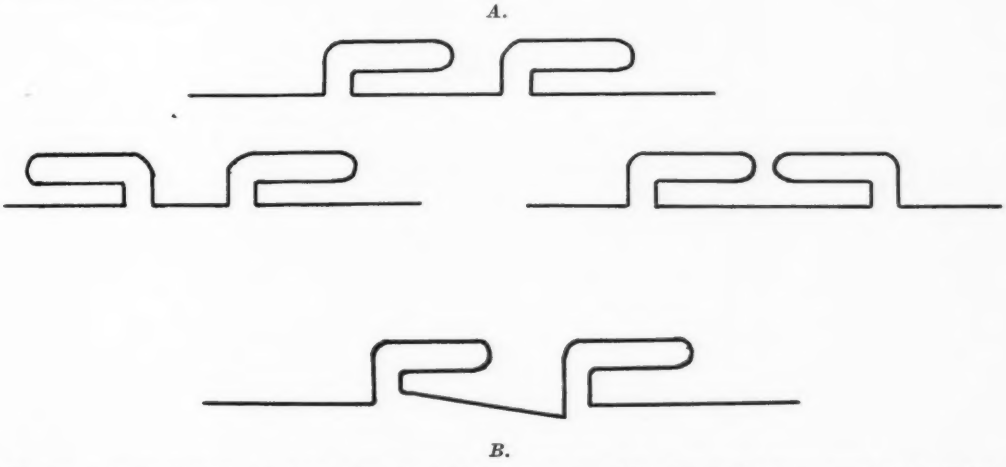


Fig. 11.—*A*, Variations of double horizontal loop. *B*, Double horizontal loop used for tipping.

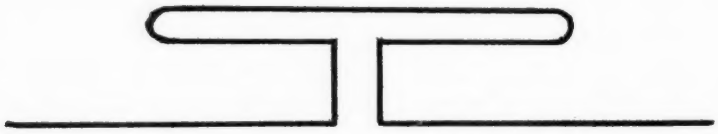
It may be contoured on either side of a severely positioned tooth to rotate it within limits. When used with rectangular wire, it can be effective in tipping the root of a tooth mesially or distally. One loop can be contoured to elevate and the other loop can be contoured to depress, tending to tip the tooth or move the roots (Fig. 11, *B*).

7. *Horizontal "T" Loop (Fig. 12).*—The horizontal "T" loop, named for its shape, is employed to get double the force reduction available in a single horizontal loop. This loop eliminates the undesirable occlusal or gingival deflection of the arch wire when activated, which may produce undesirable tipping. The "T" loop will elevate or depress in a true vertical plane.

8. *Box Loop (Fig. 13).*—The box loop is a combination of vertical and horizontal levers designed in such a manner as to have a horizontal section of wire unattached at the mesial and distal surfaces of a tooth. This free horizontal section is inclined to the bracket slot in such a manner that, when engaged,

it moves the root of a tooth in a mesial or distal direction. When it is used to tip the root of a tooth, the crown of the tooth to be moved must be tied directly to the tooth behind it to prevent undesirable movement in an opposite direction which would tend to open space between the teeth.

Fig. 12.



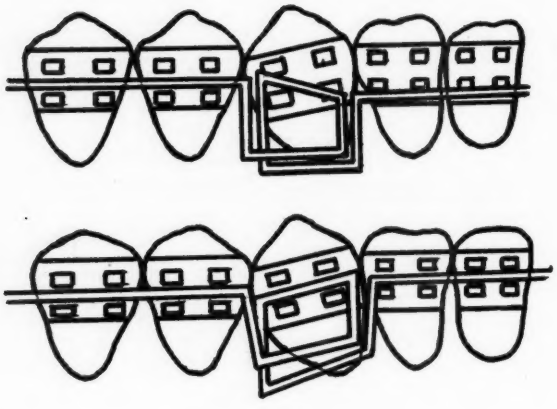


Fig. 13.

Fig. 12.—Horizontal "T" loops.
Fig. 13.—Box loop.

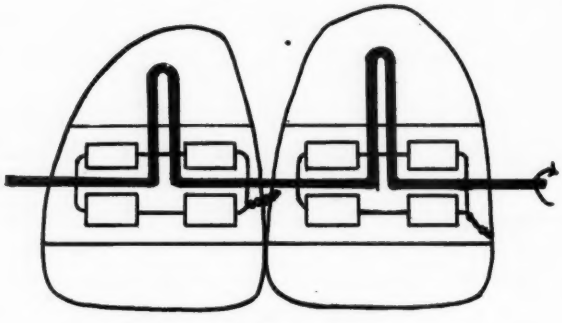


Fig. 14.—Torquing loop.

When the box loop is used to tip the roots of canines distally, the operator must form the loop in such a manner that the anterior vertical legs are shorter to prevent undesirable elevation of the anterior teeth.

There are a few things which an operator should keep in mind when planning the use of a box loop. First, of course, the design of the box loop should be determined by the action that the operator desires and may be varied through

several modifications. The principle involves a freely movable horizontal section. Finally, the best results are obtained when a rectangular wire is used, avoiding the undesirable torque that may be produced by round wire.

9. *Torquing Loop (Fig. 14).*—The torquing loop is a compressed vertical loop which may be seated between twin brackets or adjacent to single brackets. It is contoured to press against the gingival surface of the crown and is activated by ligating the brackets. When the buccal segments are stabilized, it tends to exert lingual root thrust. When used in round wire, it also stabilizes vertical loops and prevents their impinging on the labial or gingival mucosa.

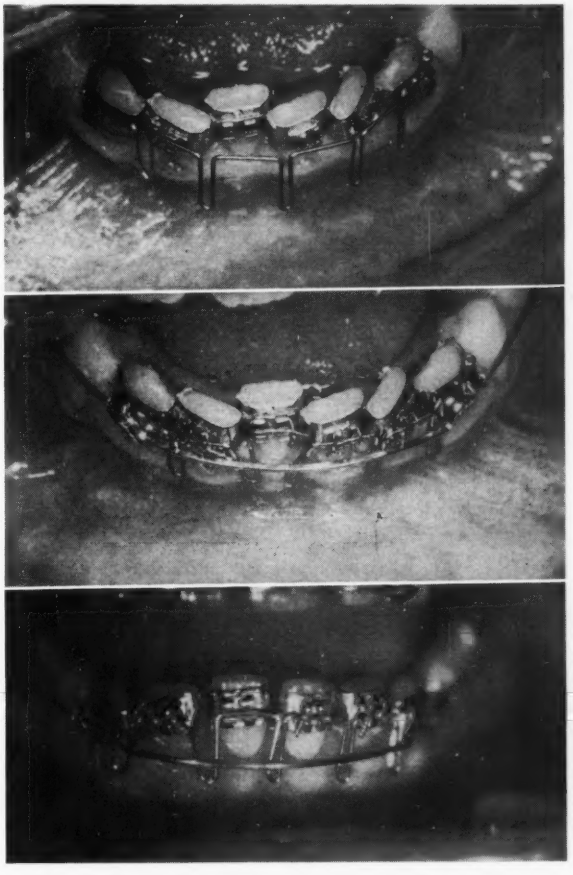


Fig. 15.—*A*, Sectional arch with vertical loops, passive. *B*, Same arch seated and held in place with rectangular base wire. *C*, Sectional arch expended four weeks later.

CLINICAL APPLICATION

At this point, several different loop designs have been described and the suggestion has been made that they can be quite effective additional means for controlling orthodontic forces. Let us continue by viewing the clinical activity of several of the different types of loops being used for rotations, space opening, space closure, elongation, depression, and other basic tooth movements.

Rotation and Space Opening.—The vertical loops shown in Fig. 15, *A* are being used to correct the rotations and lingual deflections and to open space.

The loops are incorporated with a short anterior segment in this particular case. The anterior sectional arch wire is in a passive state. The loops wedge between the mesial rotation levers and the labial surface of the cuspid band. When tied into place, they will be compressed, tending to expand that labial section.

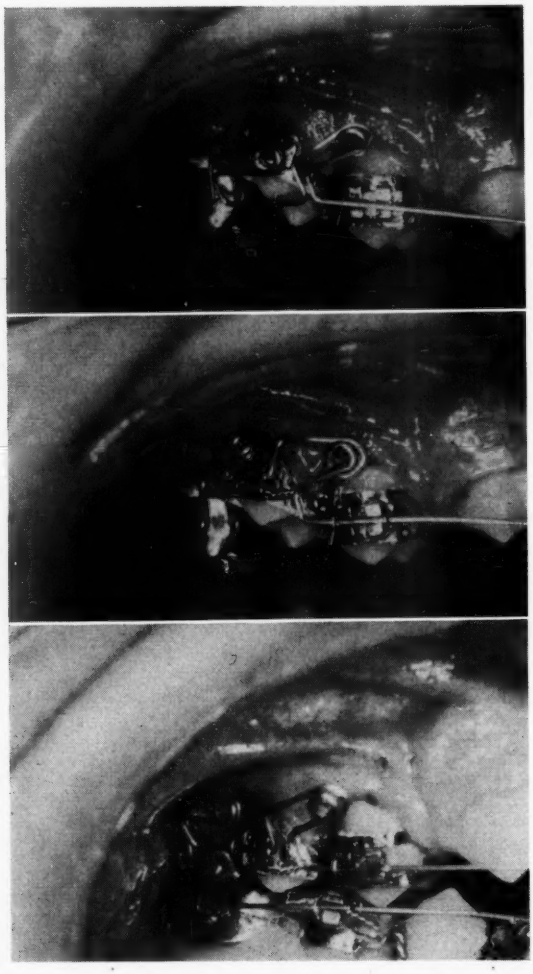


Fig. 16.—*A*, Double vertical loop with helical coils, passive. *B*, Same loop seated with immediate bracket engagement on "high" second premolar. *C*, Four weeks later.

In Fig. 15, *B* the arch wire has been tied into place. To prevent labial expansion and to develop space by a distal thrust against the canines, a rectangular base wire is engaged in the canine bracket and stepped down, contacting the loops and holding them intact. The only way these loops can expend themselves is to deflect themselves distally on the canine or perhaps to move the teeth somewhat occlusally.

Fig. 15, *C*, taken four weeks later from a more labial view, shows that spacing has occurred and rotations have been corrected. Although several anterior teeth have erupted a bit, there is no cause for concern since this vertical malposition can be overcome easily with the use of horizontal loops, as will be demonstrated later.

Elevation.—Rapid elevation of severely positioned teeth is possible through the use of a double horizontal helical loop. This was the loop design chosen to move the surgically exposed premolar shown in Fig. 16, *A*. It was coming in after months of waiting, and it was finally possible to band it. The double horizontal loop reduces force in the occlusogingival plane and, by making it a double horizontal helical loop, force is further reduced while the range of activity is increased. Fig. 16, *A* shows the contour of the wire in the passive state before bracket engagement.

Fig. 16, *B* demonstrates how easily bracket engagement is effected in this first adjustment without excessive force. Without the use of the horizontal loop, immediate bracket engagement of the arch wire could not be attained in this case without forcing the arch wire into a set that would have impaired its activity.

Fig. 16, *C* shows the case at the next visit. Notice that the tooth has been brought right down into line.

Depression.—Fig. 17, *A* also shows the double horizontal loop—this time contoured in a rectangular wire. (Further force reduction was obtained by placing the loops in a reducing solution—an electrolytic polisher.) The tooth in this case was just banded, and mechanics have been at work to open space for it. This is the first banding of this tooth, which was severely lingually positioned. This is a case in which there are but three incisors and the canine is being moved into the anterior segment. The arch wire will cross the bracket at a severe inclination. With rectangular wire, immediate bracket engagement would not have been possible without the loops. This loop will draw the tooth labially, move the root mesially, upright it, and depress it.

Fig. 17, *B* shows the activation of the loop and the arch wire. Immediate bracket engagement has been accomplished by compressing the distal loop and opening the mesial loop.

In Fig. 17, *C* the tooth literally has been depressed into the socket and drawn out labially. There is still some activity in the loop, since the horizontal section of the wire is slightly above the wire on either side of it. This shows how this particular type of loop conformation can be used effectively to depress and rotate teeth, tip the roots, and move them labially.

Second Molar Alignment.—Occasionally the horizontal loop may be used to bring a second molar into position when it has not been a part of the original strap-up (Fig. 18, *A*). A horizontal loop with a helical coil is placed mesial to the second molar. The second molars were banded late in treatment. The loop has been bent to overlie the first molar, thus activating the loop by compression.

Fig. 18, *B* shows the initial seating of the arch wire. Notice how elongated the tooth is. It would be impossible with conventional procedures to seat a rectangular arch wire without prior use of one or possibly several lighter—gauge wires.

Fig. 18, *C* shows that in four weeks the tooth has been retracted into its socket and brought into line with the first molar. The cusps are all in the same occlusal plane.

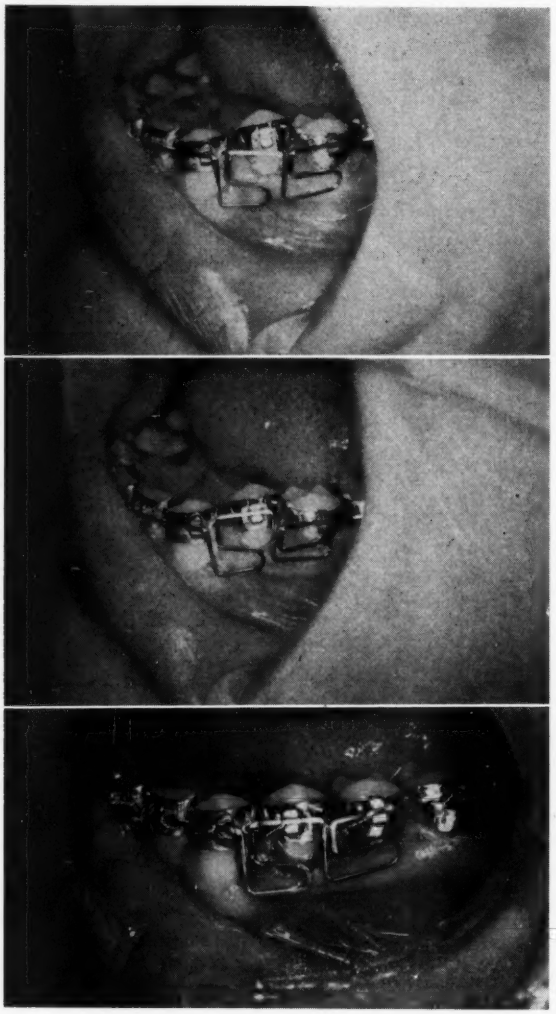


Fig. 17.—*A*, Double horizontal loop contoured in rectangular wire, passive. (Wire in loop area only has been reduced in anodic polisher to lower force value.) *B*, Same loop activated with full bracket engagement. *C*, Six weeks later.

Depression of Anterior Segment.—A very common and successful application of a horizontal loop can be achieved when it is used to depress the anterior segment. If a pair of these loops is contoured mesial to the canine, the reciprocal activity with a long range of action will be very effective. The arch wire shown in Fig. 19, *A* was selected for the initial seating late in the treatment. Until then no bands or appliances had been used in the lower arch, but it was decided to include the lower arch in the treatment to reduce the overbite.

Fig. 19, *B* shows the arch wire tied into place. As can be seen, the upper arch is pretty well along in treatment; however, the case can be improved if the lower teeth are brought into better alignment.

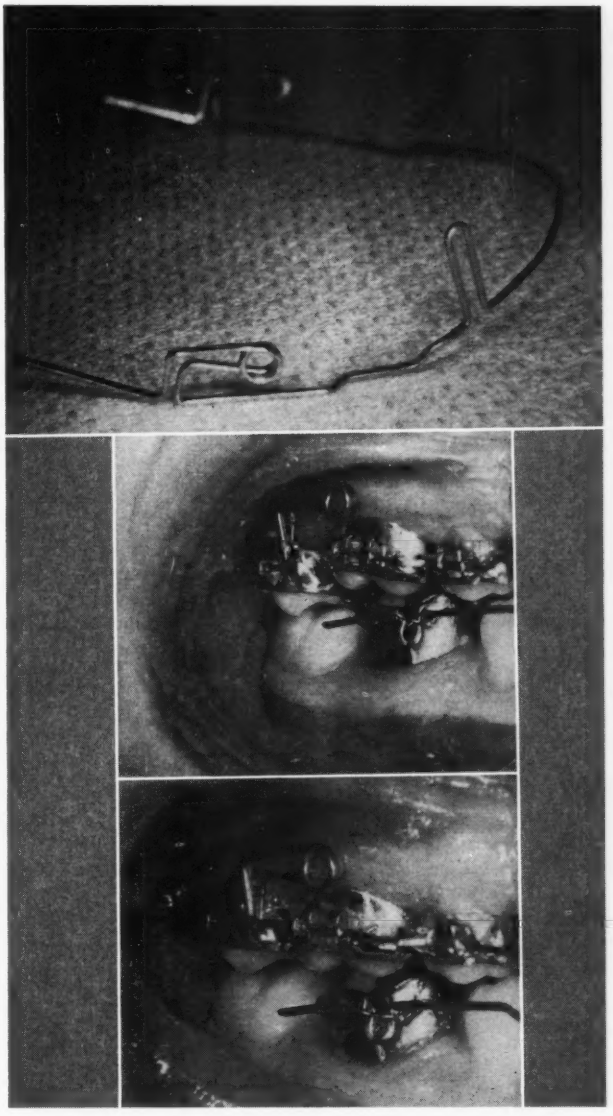


Fig. 18.—*A*, Arch wire designed with horizontal loop to align elongated second molar. *B*, Same arch wire seated in position. (The second molar had not been banded until this time.) *C*, Four weeks later, loop expended. (Note improved relationship of maxillary first and second molars.)

Eight weeks later, the new arch shown in Fig. 19, *C* was inserted with a similar type of depression loop, this time distal to the canine, and the improvement that occurred in the vertical overbite is obvious. Undoubtedly, reciprocal elevating activity on the posterior segments also occurred.

Root Tipping or Root Paralleling.—Root tipping is effectively accomplished by use of a box loop. Any box loop includes the same mechanics—namely, a horizontal section of free wire against the bracket of a distally or mesially inclined tooth, inclining it in such a manner as to produce the directional force

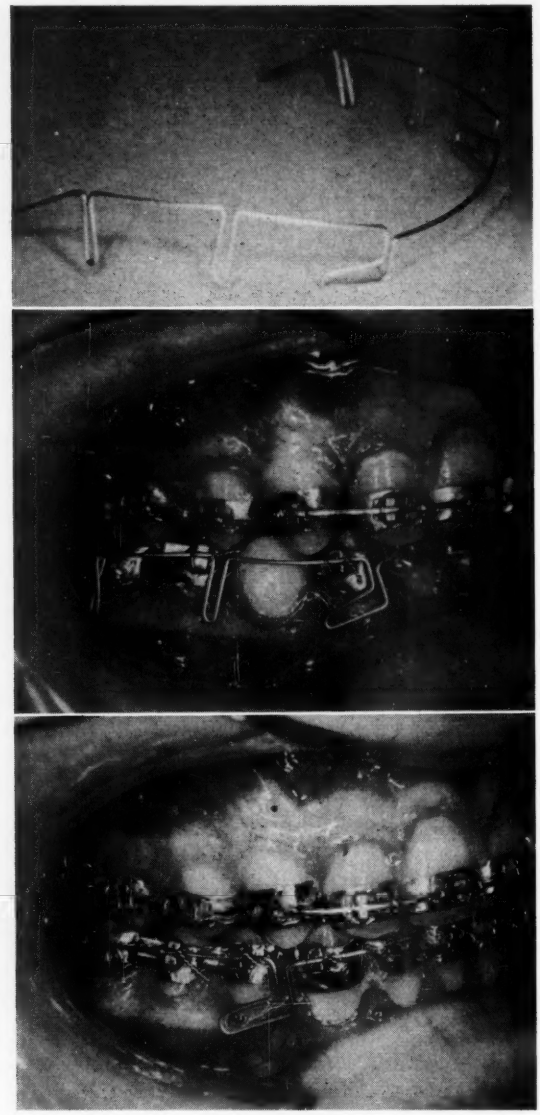
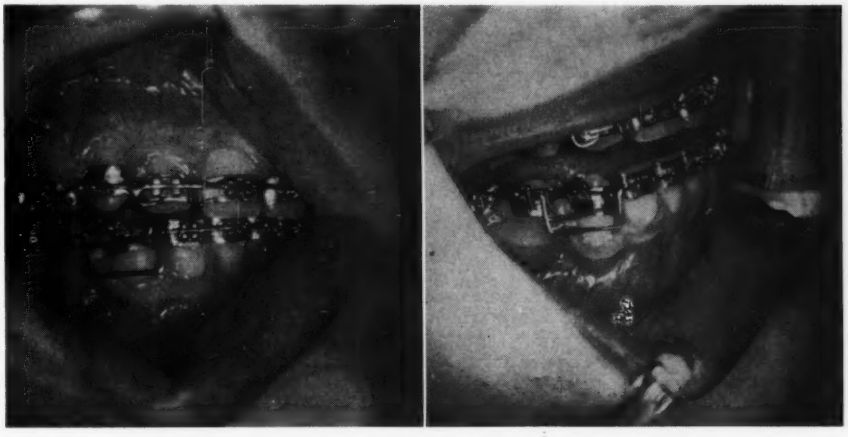


Fig. 19.—*A*, Initial arch wire to be seated for depression of lower incisors. *B*, Arch wire seated. *C*, Four weeks later first premolar was banded and new arch was seated to complete alignment. (Note improved overbite in incisor area.)

necessary to move the root in the direction desired. The distally inclined cuspid shown in Fig. 20, *A* is in bad position. Everything else in the case is well along in treatment.

Fig. 20, *B* shows the same case eight weeks after the box loop was tied into place. It takes longer for the root of a tooth to move than it does for the crown of a tooth to tip. The lower cuspid now has a mesioaxial inclination, and the case is ready for retention.



A. *B.*

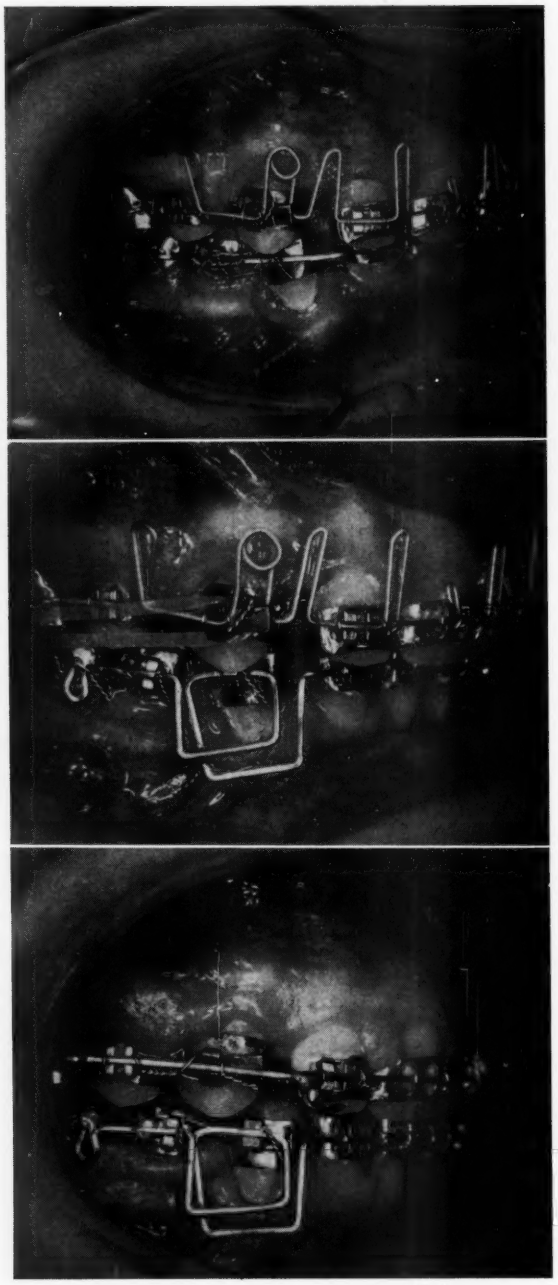
Fig. 20.—*A*, Box loop activated to correct axial inclination of lower canine. *B*, Eight weeks later.

Axial Inclination Correction.—Fig. 21, *A* shows another case in which the lower canine has a distoaxial inclination. Although we are not primarily discussing the maxillary arch, some notice should be given several different types of loops seen in the maxillary arch. Other loops of interest here are a closed loop activated by tie-backs in the maxillary arch, a series of vertical loops mesial to the canine, a torquing loop between the twin brackets of the central incisors, and a rotational vertical loop on either side of the lateral incisors.

Four weeks after a box loop was inserted, the lower canine has started to upright (Fig. 21, *B*). Ten weeks later and the box loop has changed the axial inclination of the lower canine considerably (Fig. 21, *C*).

Leveling and Rotating With Horizontal "T" Loop.—Fig. 22, *A* shows the arch wire used in this case. There are two large horizontal "T" loops distal to the central incisors, contoured in such a manner that the arch wire lies in a flat plane. This illustrates an initial arch wire for the leveling of severely positioned anterior teeth by means of a simple design.

In Fig. 22, *B* the arch wire has been tied into place. By incorporating these horizontal "T" loops mesial to the lateral incisors and distal to the central incisors, immediate bracket engagement was possible. The effect of the adjustment will be to elevate the lateral incisors and depress the central incisors. There also will be a tendency to rotate the lateral incisors. The discrepancy between the two central incisors was not great enough to necessitate the use of a loop.



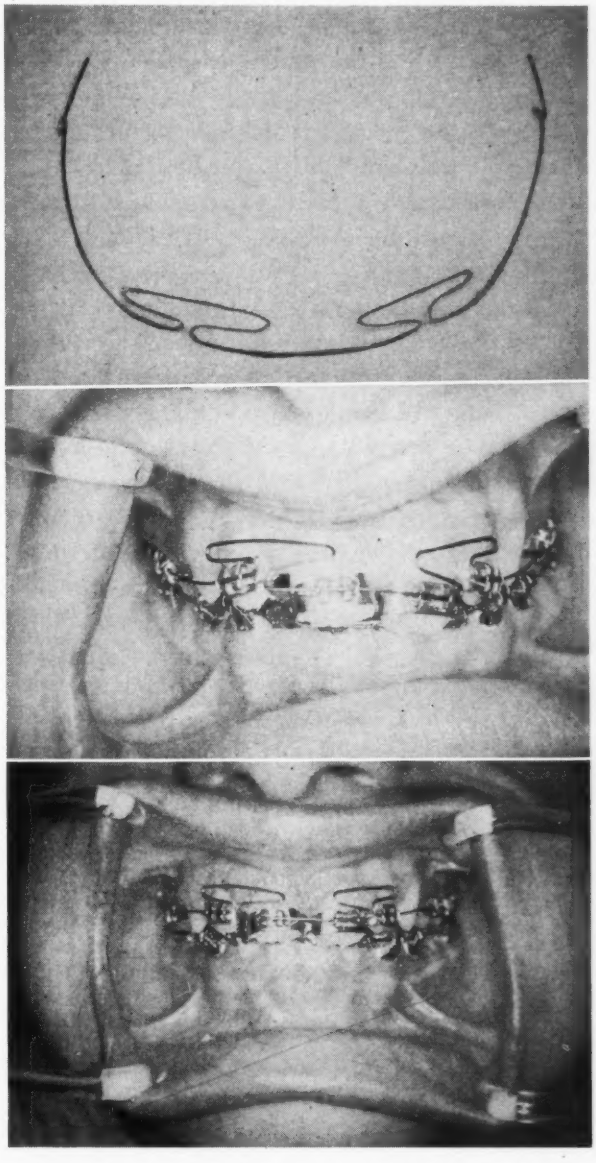
A.

B.

C.

Fig. 21.—*A*, Severe distoaxial inclination of lower right canine. *B*, Four weeks after seating of box loop. (Note canine starting to upright.) *C*, Ten weeks later, canine position completely corrected.

Fig. 22, *C* shows the same case four weeks later as the loop expended itself. The teeth are now in the same horizontal plane; the lateral incisors have been brought into line with the central incisors, and the central incisors have improved in their position with each other and with the lateral incisors. Rotations in the lateral incisors have corrected themselves. From this point on, conventional procedures were adopted.



A.

B.

C.

Fig. 22.—*A*, Use of horizontal "T" loops for anterior alignment, passive. *B*, Above arch activated. *C*, Four weeks later. (Note complete correction of rotations, bracket alignment, and retractions.)

SUMMARY AND CONCLUSIONS

An analysis has been made of the necessity for effective force control in appliance therapy. If control can be established over direction, degree, duration, and distribution of forces in orthodontic appliances, then efficient tooth movement can be anticipated. A thorough description has been given of loop designs, both old and new, that can be exceedingly helpful in establishing the positive control of force in all three planes of space so necessary for efficient tooth movement.

Many operators are quite proficient in their technique. Undoubtedly, this has been due to effective force control. Regardless of what appliance is being used, it is the application of the mechanics to move teeth without losing this control that permits the operator to obtain his results.

The loops may be used as an adjunct to any given technique or treatment philosophy without disturbing the gross treatment plan. They may be used to recover individual teeth that have moved to undesirable positions during treatment. Careful thought concerning effective synchronized tooth movement may lead to the inclusion of some of these loops in combinations for a different approach to tooth movement in certain types of cases.

It should always be borne in mind that the selection of removable auxiliary attachments, metal ligature ties, and lighter—gauge resilient wires and the inclusion of different designs of loops in arch wires will depend upon the requirements of the individual case and the operator's ability to apply them to his treatment technique and philosophy.

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PRESENT ORTHODONTIC THOUGHT IN GERMANY

Jaw Widening With Active Appliances in Cases of Mouth Breathing

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RESEARCH into the origin of abnormal narrowness of the jaws, especially the maxilla, which we carried out by means of many individual and serial examinations of children during infancy and early childhood, has shown that every marked alteration of the jaw due to inhibition of growth or deformation is not a local symptom but merely a characteristic of a complex anomaly which usually extends beyond the immediate region of the jaws. The proximity of the maxilla and the palate to the region of the nose and the sinuses makes it clear that every deformation of the maxilla coupled with a pathologic high palate must be accompanied by a retardation of growth and narrowness of the nasal cavity. The strong developmental stimuli which the masticatory organ imparts to the middle face also explain that in most cases of severe underdevelopment of the jaw and correspondingly reduced function, the facial skull also shows definite signs of underdevelopment. These relationships are well known to every orthodontist, and I am only pointing them out because they are too often forgotten in the effort to create a dental arch which is as harmonious as possible.

On the other hand, during the course of daily practice one is constantly reminded of these important relationships. The ear, nose, and throat specialist often enough refers his mouth-breathing patients for orthodontic treatment when he has realized that the malocclusion and, above all, the narrowness of the jaw are the chief cause for the impeded nasal respiration and that his own treatment is no longer sufficient to prevent the recurring diseases of the respiratory tract. In many cases free nasal respiration can be achieved only by an extensive widening of the maxilla and the palate. The patient often registers the widening of the nasal passage with the happy statement: "At last I can really get air!" In many, but not all, cases the widening of the jaw has to be coupled with a movement of the mandible into the correct bite.

In these cases of malocclusion with distoclusion, unilateral or bilateral cross-bite, or progenia with mesioclusion, there is always a greater or lesser narrowness of the upper jaw as an important accompanying symptom. In the case

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of the most frequently occurring group—the compression anomalies—this symptom is the primary one and is genetically the most important. In all these cases the widening of the jaws, especially the maxilla, is an essential prerequisite to treatment and to the creation of a chewing organ with sufficient function.

TIMELY TREATMENT

If the widening of the upper arch is carried out at a favorable stage of development, then the forces acting during the development of the teeth and the change of dentition can be released to such an extent that in a very short time occlusal anomalies caused by locking of the bite can correct themselves spontaneously. Our attention was first drawn to these important relationships by serial examinations. Today this knowledge is extensively laid down in the well-founded principles appertaining to timely treatment.

The orthodontic widening of the dental arches and jaws is therefore a well-founded measure which is extremely favorable for the occlusion and articulation of the denture as well as for the build-up and development of the entire facial skull. For some years now, the voices which emphasize that such a widening is only of short duration and that soon after the termination of treatment the narrowness of the arches gradually returns have been increasing. Chapman some years ago summarized this opinion in the question: "Is arch expansion a fallacy?" He did not answer the question, however. The extraction treatment, which has recently become very fashionable in some countries, is also based on this doubting opinion and thus justifies its therapeutic measures.

In the classical country of orthodontics, the United States, it required some courage not so long ago to advocate the extraction of teeth as a therapeutic measure. Today this point of view has altered completely, as I have been informed by American orthodontists visiting Europe, and some orthodontists are truthful enough to admit that they extract in 50 per cent and more of their cases. Has recent special research led to this altered point of view? I could not find any information on such research in the relevant postwar American literature which I was able to obtain. Suspicion is therefore aroused that this increased use of extraction therapy *is not a positive further development of the field but, rather, a lowering of the aims to earlier, less demanding therapeutic results.*

For the expansion of the arches and jaws, quite a number of appliances are available—active and passive ones, fixed and removable ones. The functional orthodontic appliance, the *activator*, in addition to moving the bite and carrying out other tooth movements, attempts to expand the arches. In single cases, especially those with a favorable reaction, noteworthy and sometimes sufficient expansion of the upper and lower arches can be achieved with this appliance, as in the case shown in Figs. 1 and 2. An expansion of 7 to 8 mm., however, must be regarded as rare. On the average, the expansion remains too little (2 to 3.5 mm.), despite a duration of treatment of two to three years, to be sufficient in marked cases of compression of the jaws.

Much more extensive expansion can be achieved with active appliances, especially the expansion plate which is very commonly used in Europe and which, having direct contact with the surface of the palate and the lingual slope of the alveolar process, can achieve marked expansions during a comparatively short time under biologically favorable conditions. As a result of the

Fig. 1.

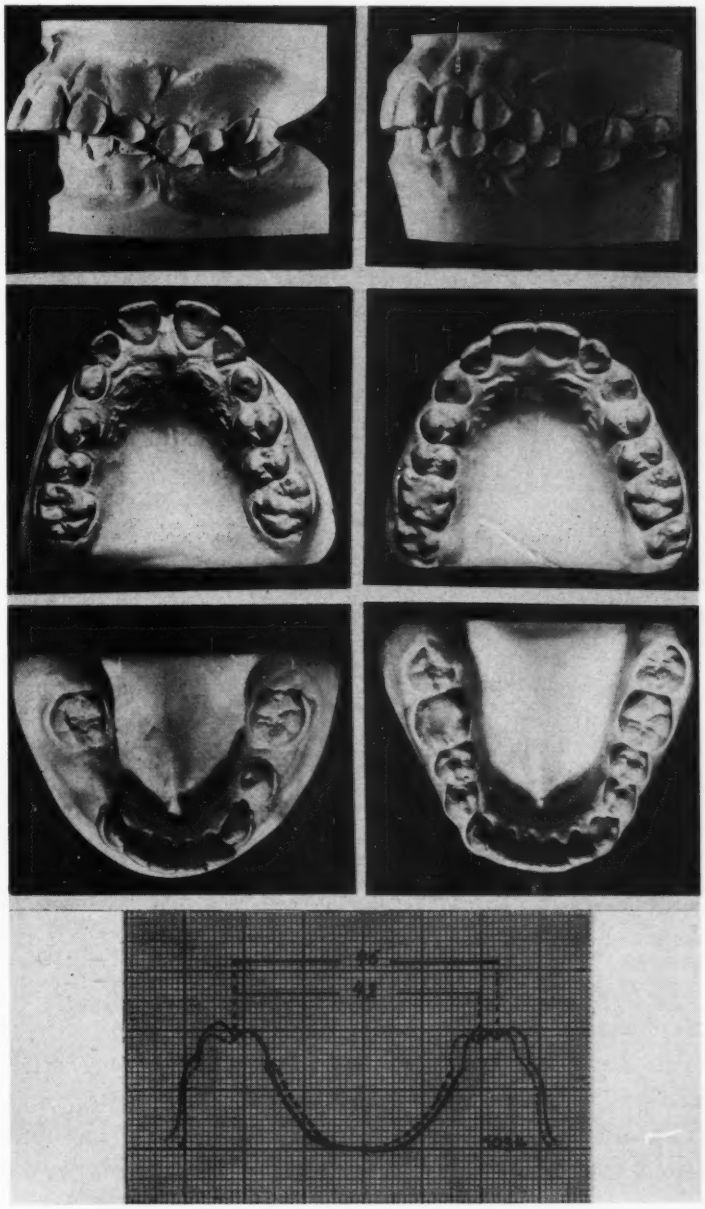


Fig. 2.

Fig. 1.—Case 1, Patient Sch. P. Compression of the jaws with upper protrusion and distoclusion. Bilateral inhibition of growth in the lower arch due to premature loss of deciduous teeth. Treated only with an activator from 1945 to 1947. The maximum expansion achieved was 4 mm.

Fig. 2.—Case 1, Patient Sch. P. Transverse curve of the palate in the region of the second premolars before and after treatment.

surface action, tipping movements of the buccal teeth in a transverse direction are only slight and there is also a definite expansion in the region of the apical base.

The transverse curves of the palates of Cases 2 to 11 (Figs. 4, 5, 16, and 19), which have been taken from my current practice, demonstrate this point. Here

Fig. 3.

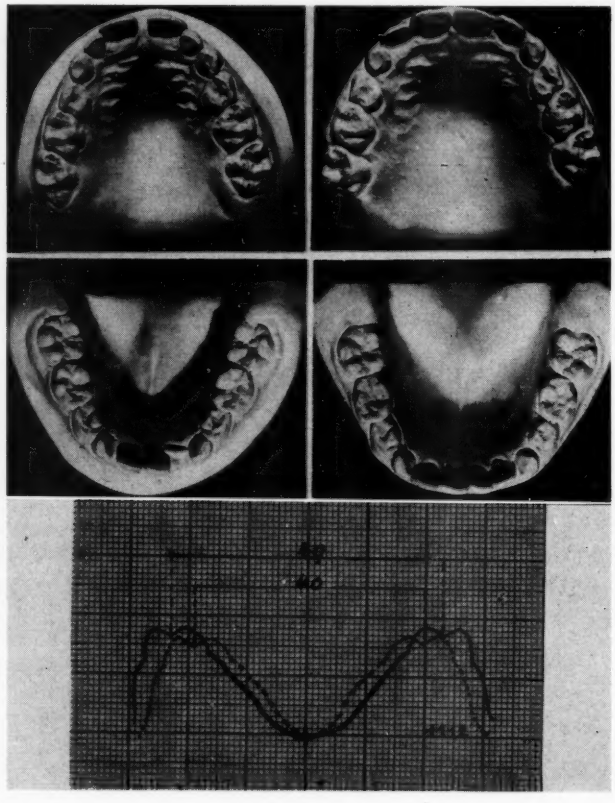


Fig. 4.

Fig. 3.—Case 2, Patient Sch. M. Compression of the jaws with crowding of the anterior teeth (latent) and distoclusion. Initially active plates were used in both jaws; then for the adjustment of the occlusion, an activator was employed. Expansion of the jaws in the region of the upper second premolars was 9 mm. There was no tipping of the buccal teeth!

Fig. 4.—Case 2, Patient Sch. M. Corresponding transverse curves of the palate.

not only a displacement of the alveolar arches in a buccal direction but also a definite expansion of the vault of the palate can be seen. The zone of the so-called "apical base" can therefore be influenced, at least in its transverse development, by orthodontic measures. I would like to place special emphasis on this statement, which is contrary to the opinions of Lundström and others. The subsequent development of the roof of the palate and therefore also of the floor of the nose, which can be recognized on any good model of the upper arch, explains the clinical observations, which have already been mentioned, concerning the improvement of the nasal passage after widening.

The action of the fixed active appliances should not be very different, however, from that of the active expansion plate. As Boesen was able to show, many years ago in my clinic, the buccal movement of the teeth carried out with the aid of a lingual arch is accompanied by an obvious expansion of the palate. Apart from the tipping movements of the teeth, there is a "bodily

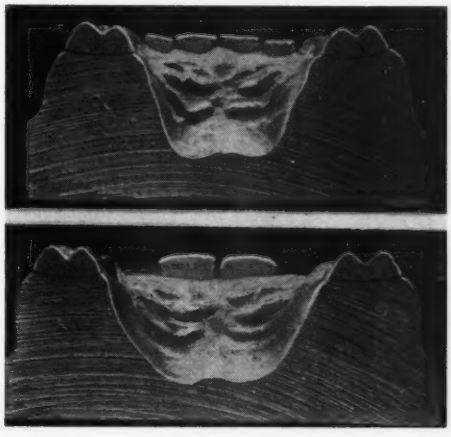


Fig. 5.—Widening of the palate by expanding the upper jaw 5 mm. with an expansion plate. Transversal in the region of the upper second premolars.

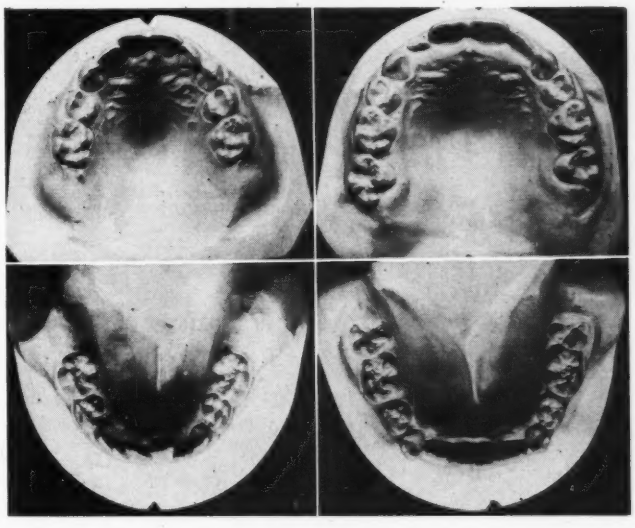


Fig. 6.—Case 3. Patient V. O., a girl aged 5 years 9 months. Models before and after treatment.

movement" of the alveolar process which may be increased by the stimuli of mastication. The extent of the expansions which can be achieved with the lingual arch can be recognized in Cases 10 and 11 which were treated with this appliance (Figs. 15 and 18).

In comparison to a fixed appliance which acts on the teeth, it is fairly evident that an active plate which acts directly on the surface of the alveolar

process and the palate can achieve more extensive and further-reaching subsequent developments in breadth.

The special advantages of the expansion plate show themselves above all in the treatment of the deciduous and changing dentitions. The expansion plate can, by means of its surface action, reshape the alveolar process so that the teeth are moved as well and the dental germs which are still in the bone can erupt in a new position. Expansion of the dental arch by means of this plate during the change of dentition, therefore, never produces a tipping of the permanent teeth after eruption, despite extensive widening. There is also very little tendency to relapse.

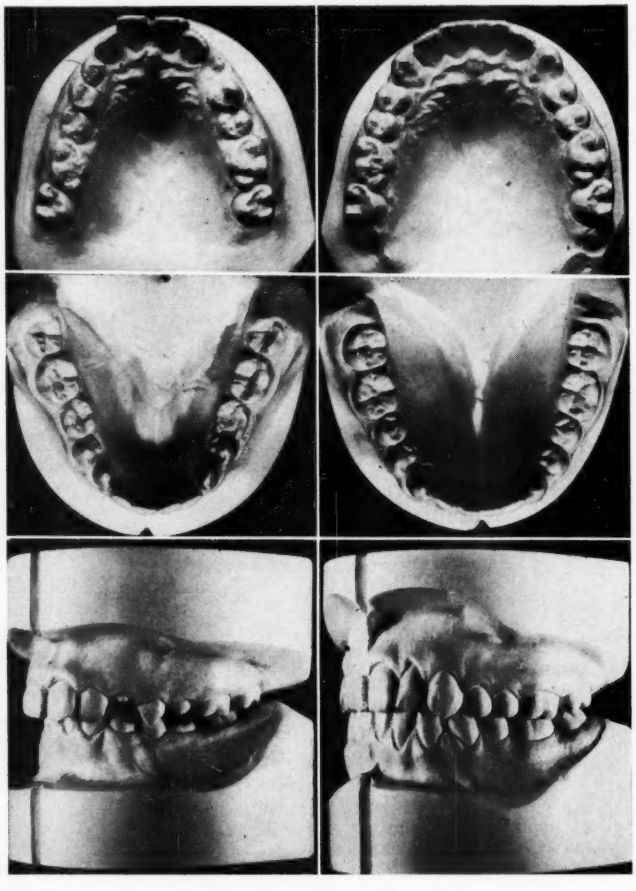


Fig. 7.—Case 4, Patient M. F.—J., at the beginning 8 years 7 months old. Models before and after retention.

The question of whether or not the careful expansion of the dental arch is permanent is very important, but unfortunately it is a little-investigated question. It can be cleared up without great difficulty by checking on patients who were treated many years ago. In this connection, I would like to show from a series of cases a few instructive examples (Figs. 15 and 18).

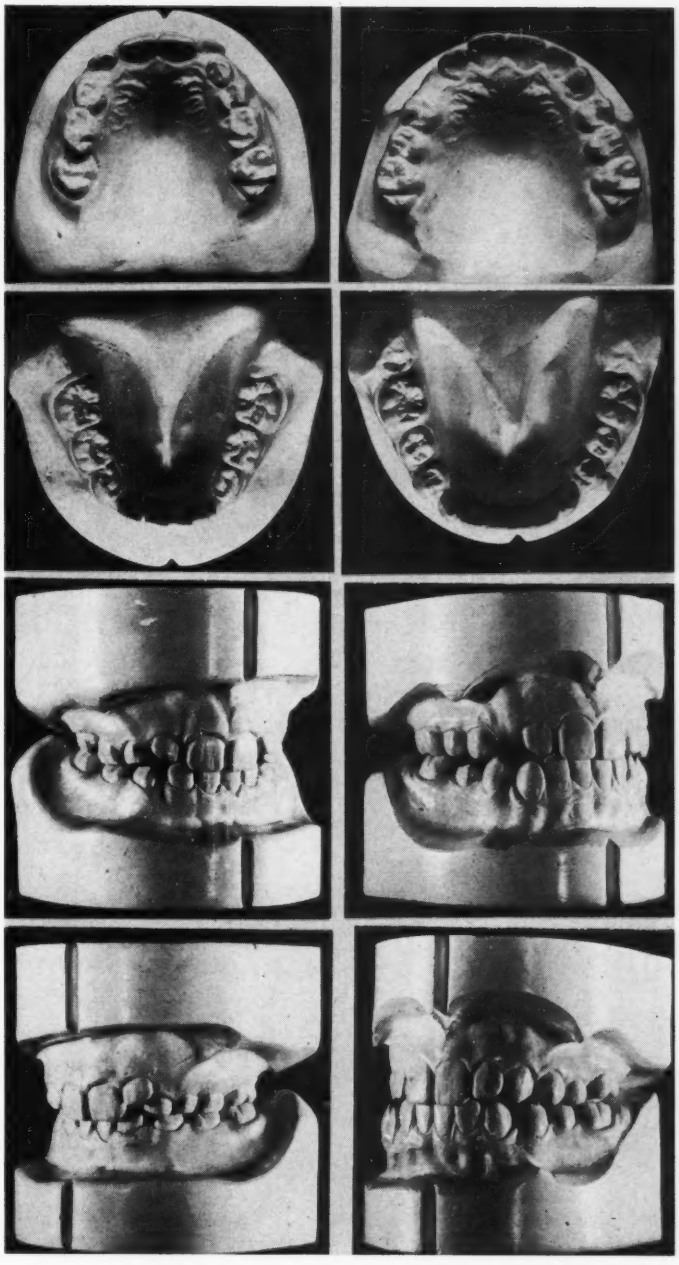


Fig. 8.—Case 5, Patient V. V. Models before and after active treatment.

Fig. 9.—Case 5, Patient V. V. Photographs.

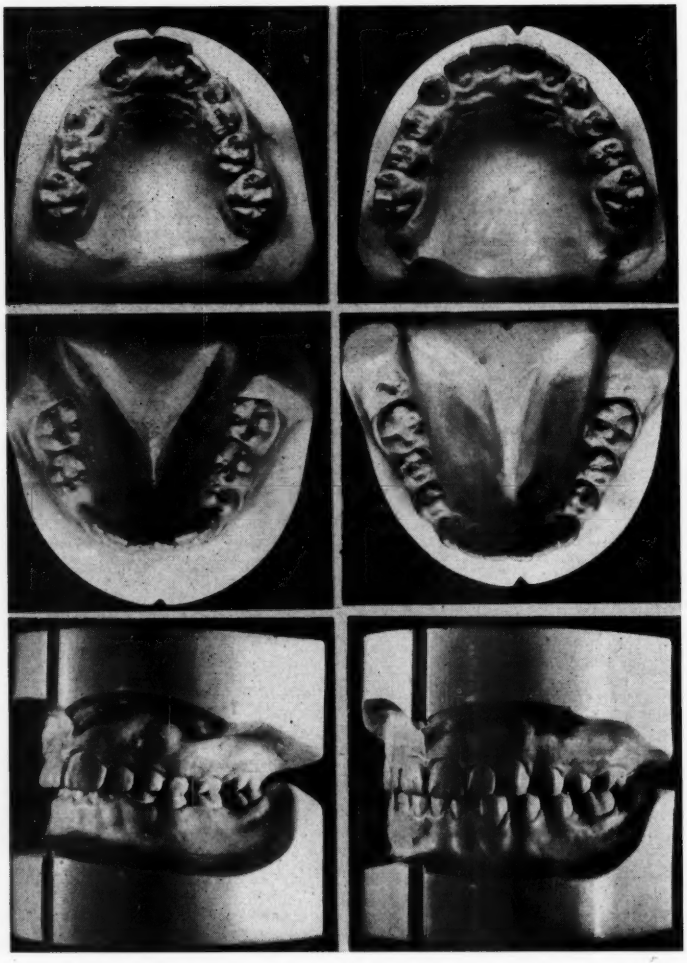


Fig. 10.—Case 6, Patient H. E. Models before and after retention treatment.

Fig. 11.

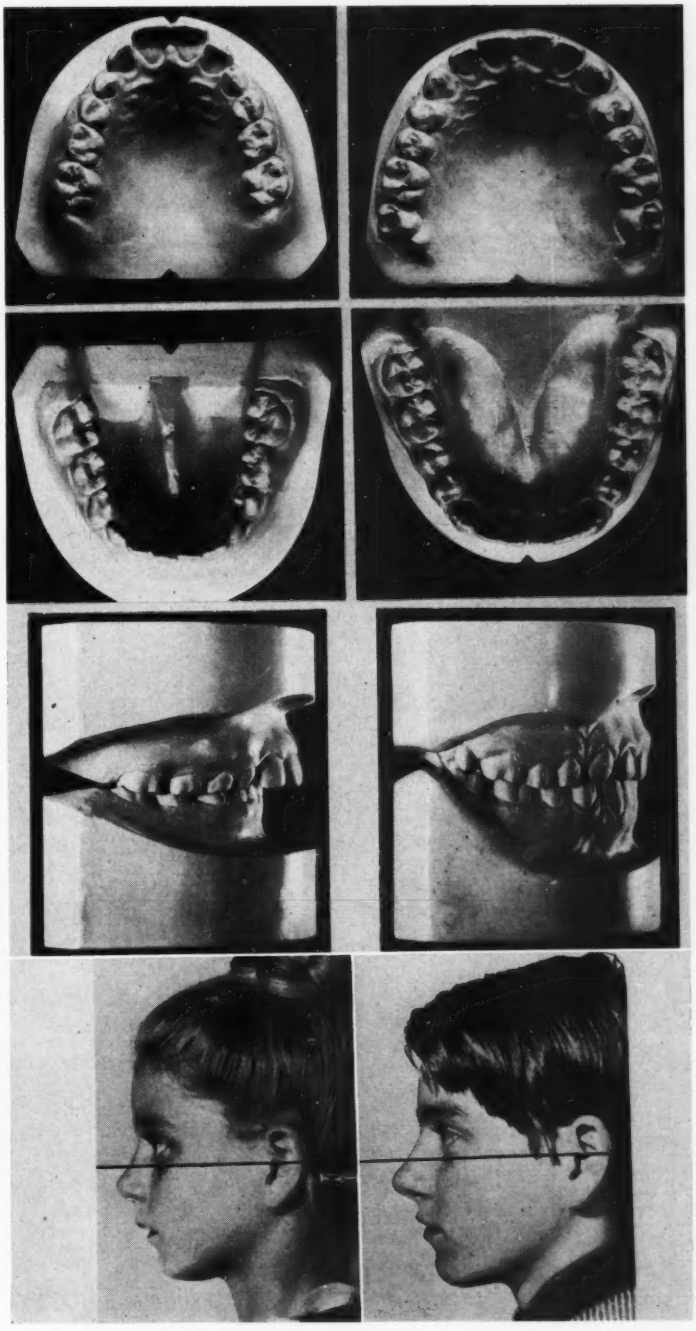


Fig. 12.

Fig. 11.—Case 7, Patient K. R. Models before and two years after treatment.
Fig. 12.—Case 7, Patient K. R., a 9-year-old girl. Photographs before and two years after treatment.

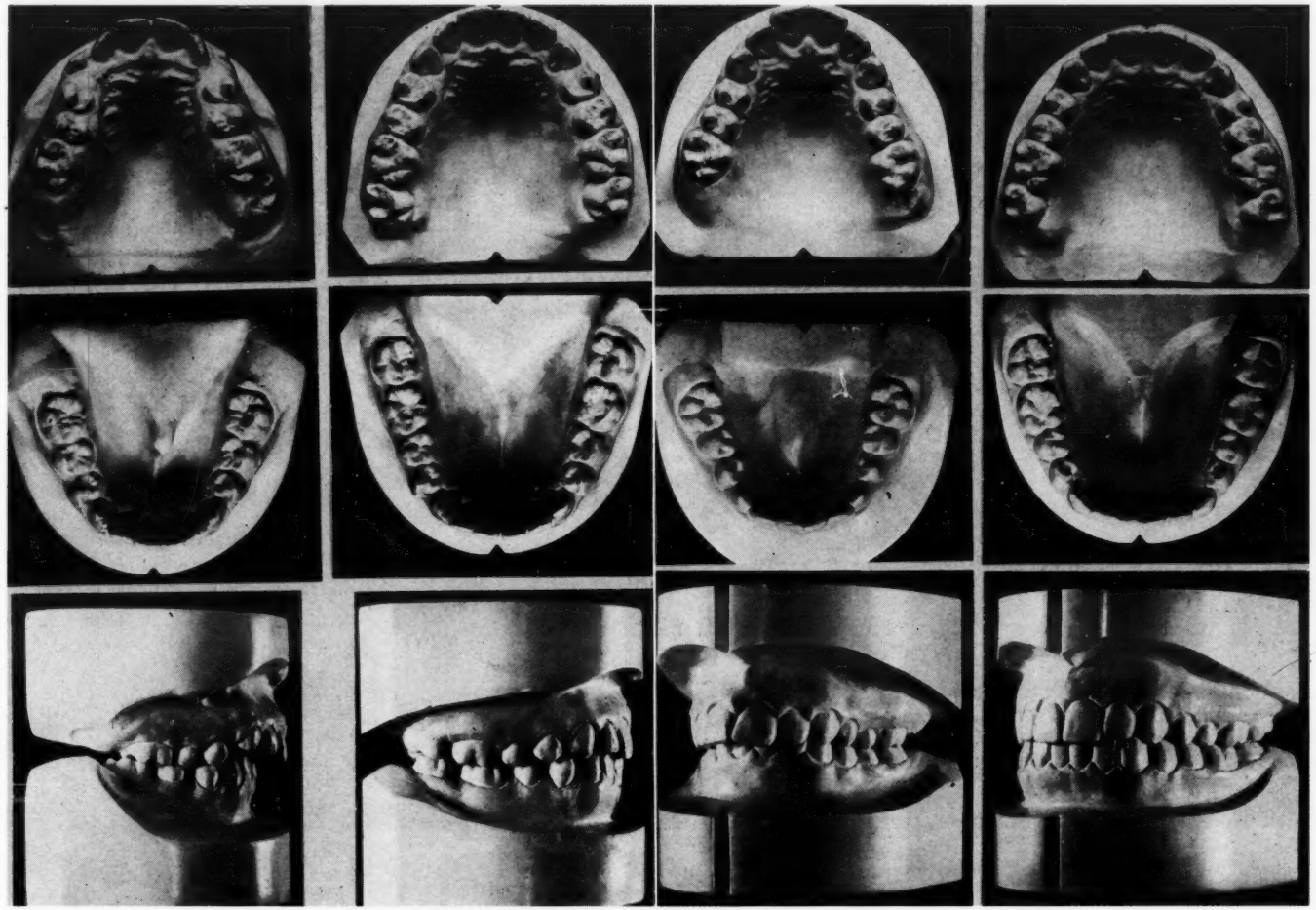
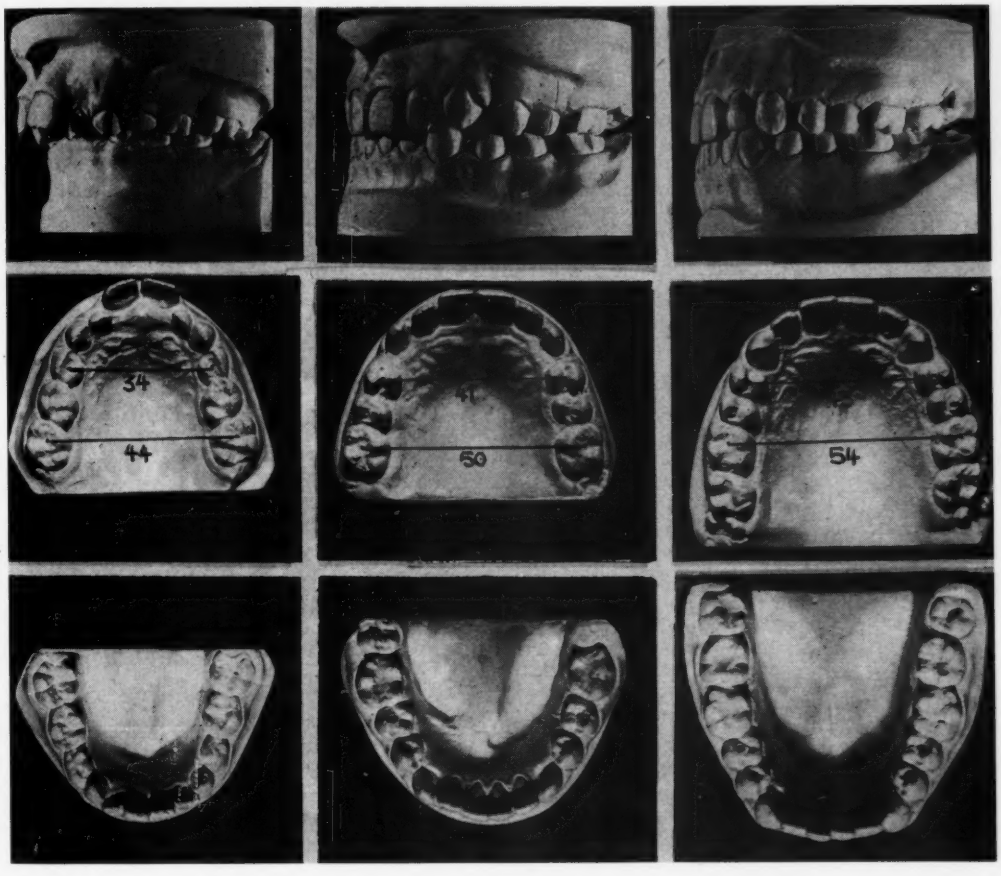


Fig. 13. Fig. 14.

Fig. 13.—Case 8, Patient D. U. Models before and two years after treatment.
Fig. 14.—Case 9, Patient H. D., a 10½-year-old girl. Models before and two years after treatment.

There is, for instance, the case of Patient B. Fr., who was treated with a lingual arch, a high labial arch, and intermaxillary elastics (Figs. 15, 16, and 17). The very narrow upper and lower arches were expanded extensively, by 7 mm., so that the upper and lower incisors could find a less narrow and cosmetically pleasing position. At the same time, the mandible was brought forward into correct occlusion in relation to the maxilla. A checkup seven and one half years



A. *B.* *C.*

Fig. 15.—Case 10, Patient B. Fr. *A*, Compression of the jaws with crowded protrusion and distoclusion. Treatment, inclusive of retention, lasted from September, 1937, to February, 1942. The upper arch was expanded by 7 mm.

B, Note adjustment of the occlusion. A lingual arch, a high labial arch, and intermaxillary elastics were the appliances used.

C, Checkup in 1949 (seven and one half years after termination of retention). The expansion of the maxilla due to the treatment has not only remained but increased (in the region of the premolars by 2 mm., in the molar region by 4 mm.) although there is obvious lack of space for the eruption of the third molars.

after retention had been terminated showed that the breadth of the upper arch had not only remained as it was at the termination of the active treatment but had even increased by 2 mm. in the region of the premolars and by 4 mm. in the region of the molars. This subsequent development must have been caused by forces which acted beyond the stimulus to growth imparted by the orthodontic treatment. Possibly the transverse growth of the middle face, of the

Fig. 14.—Case 9, Patient H. D., a 10½-year-old girl. Models before and two years after treatment.

zygomatic arches, of the skeletal supports, and of the inside of the nose influenced the growth of the dentition. A comparison of the photographs taken in 1937 and in 1949 (Fig. 17) shows the disappearance of the prognathic step of the

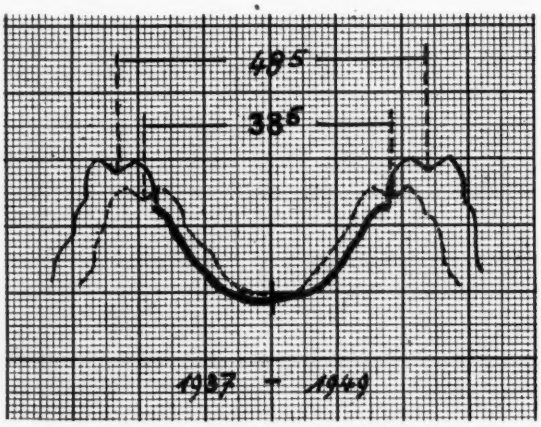
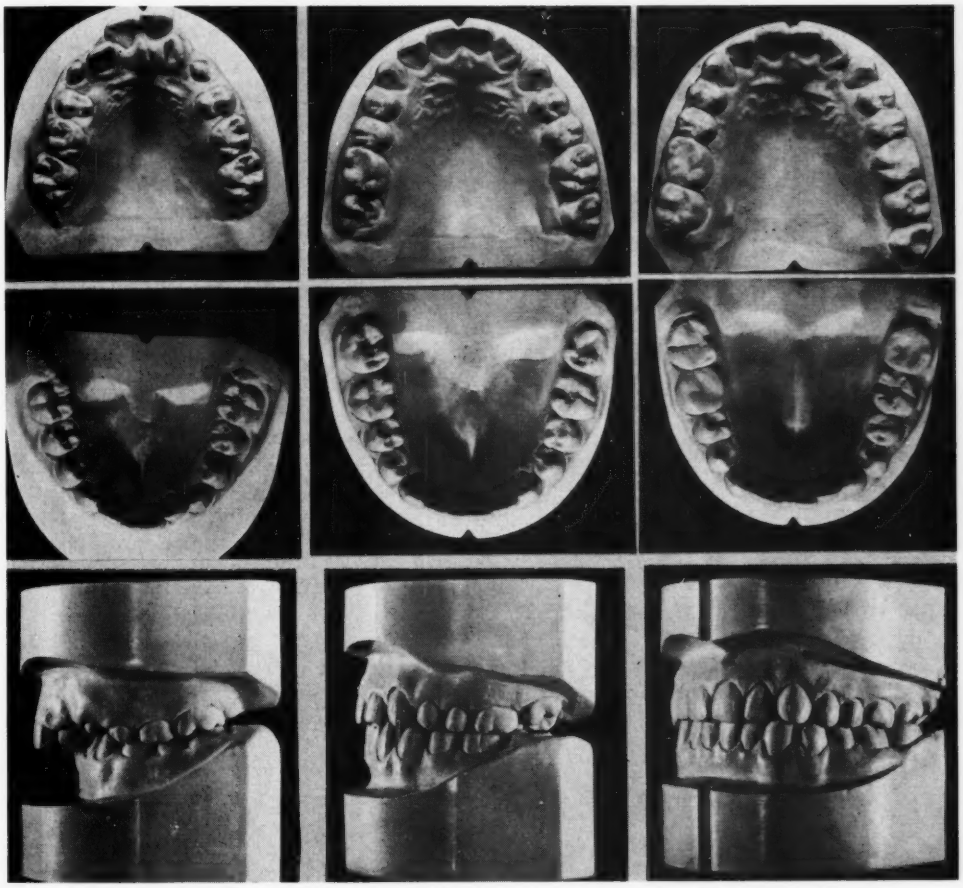


Fig. 16.—Case 10, Patient B. Fr. Comparison of the transverse curves of the palate in 1937 and in 1949.

Fig. 17.—Case 10, Patient B. Fr. Comparison of the frontal and profile photographs made in 1937 and in 1949.

lips and the attainment of the generally well-built facial skull of a leptosome type. The transverse curves of the palate show the alterations in the region of the second premolars which took place from 1937 to 1949 (Fig. 16).

In Case 11 (Patient W. W.) in which, ten years after the termination of retention, a control examination could be made, the expansion of the upper arch by 8 mm., which was carried out with a lingual arch, has remained without essential alteration. This is indicated by the identical distance of the second premolars (Fig. 18). Only in the region of the molars has a slight compression by 1.5 mm. taken place, presumably under the displacing influence of the developing third molars which can also be recognized in the lower arch by the pressed position of the lower incisors.



A. *B.* *C.*

Fig. 18.—Case 11, Patient W. W. *A*. High-grade compression of the jaws with anterior crowding (pathologically high palate) and distoclusion. Active treatment lasted from December, 1935, to July, 1938 (*B*), and involved the use of a lingual arch, a high labial arch, and intermaxillary elastics. The period of retention with retention plates was one and one-half years.

C, Checkup in October, 1949 (eleven years after active treatment and ten years after termination of retention). The degree of expansion of the jaws due to treatment has remained entirely in the anterior region. It has decreased by 1.5 mm. in the region of the molars, presumably under the influence of the erupting third molars which also shows itself in the mandible by the close position of the incisors.

In comparison to the underdeveloped maxilla with a pathologically high palate, which was present before treatment was commenced, we have here during the last ten years a normally broad maxilla with a sufficiently expanded palate, harmonic position of the incisors, and correct occlusion. The transverse

curves of the palate in the region of the second premolars show the permanent alterations which have taken place in the apical base during the period of active treatment (Fig. 19). The widened palate has hardly altered in the ten years since the completion of retention.

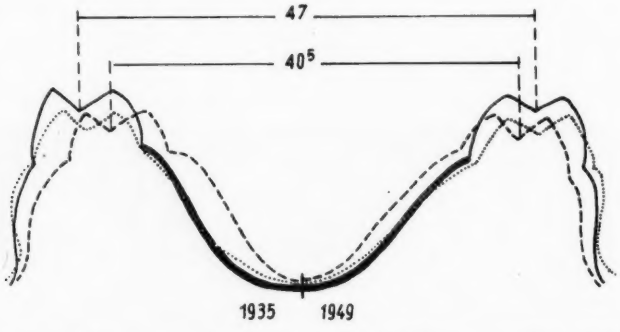


Fig. 19.—Case 11, Patient W. W. Comparison of the transverse curves of the palate between 1935 and 1949.

I hardly need emphasize that the development of the alveolar processes and jaws is subject to certain limitations which cannot be transgressed by the stimuli of an appropriate appliance. Quite often the underdevelopment of the jaws is coupled with an excessive size of the teeth. In such a case it is quite clear, as I need not explain further in this circle, that there is a definite scientific indication for extraction. I would like to state, however, that despite the excessive extraction therapy which has become so fashionable in some places, an expansion of the dental arches carried out *lege artis* in conjunction with the functional interaction of the jaws will be permanent and that the expansion of the upper apical base produced must also be regarded as a permanent improvement.

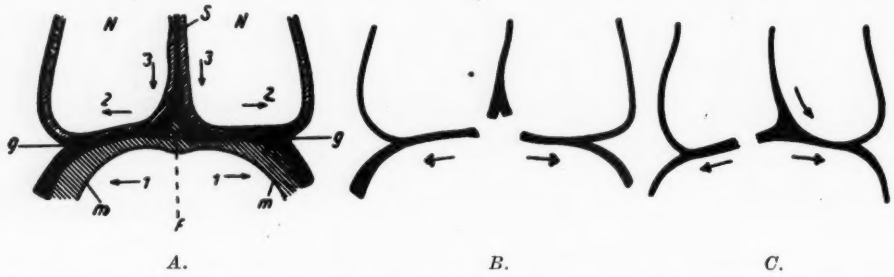


Fig. 20.—Illustration of the widening process of the median palatal suture (*Derichsweiler*). *A*, Without splitting; *B*, with double split; *C*, with one split.

Slight compression of the dental arches, coupled with a crowding of the incisors, can be attributed to the development and eruption of the third molars. To be precise, such compressions do not represent a retrograde development, that is, a return to the old anomaly; rather, they represent new deviations with a different origin and morphology. Of course, it is very difficult to gain a comprehensive insight into the complicated mutual supporting or opposing growth tendencies of the alveolar processes, the maxilla, the nose, the zygomatic

Fig. 21.

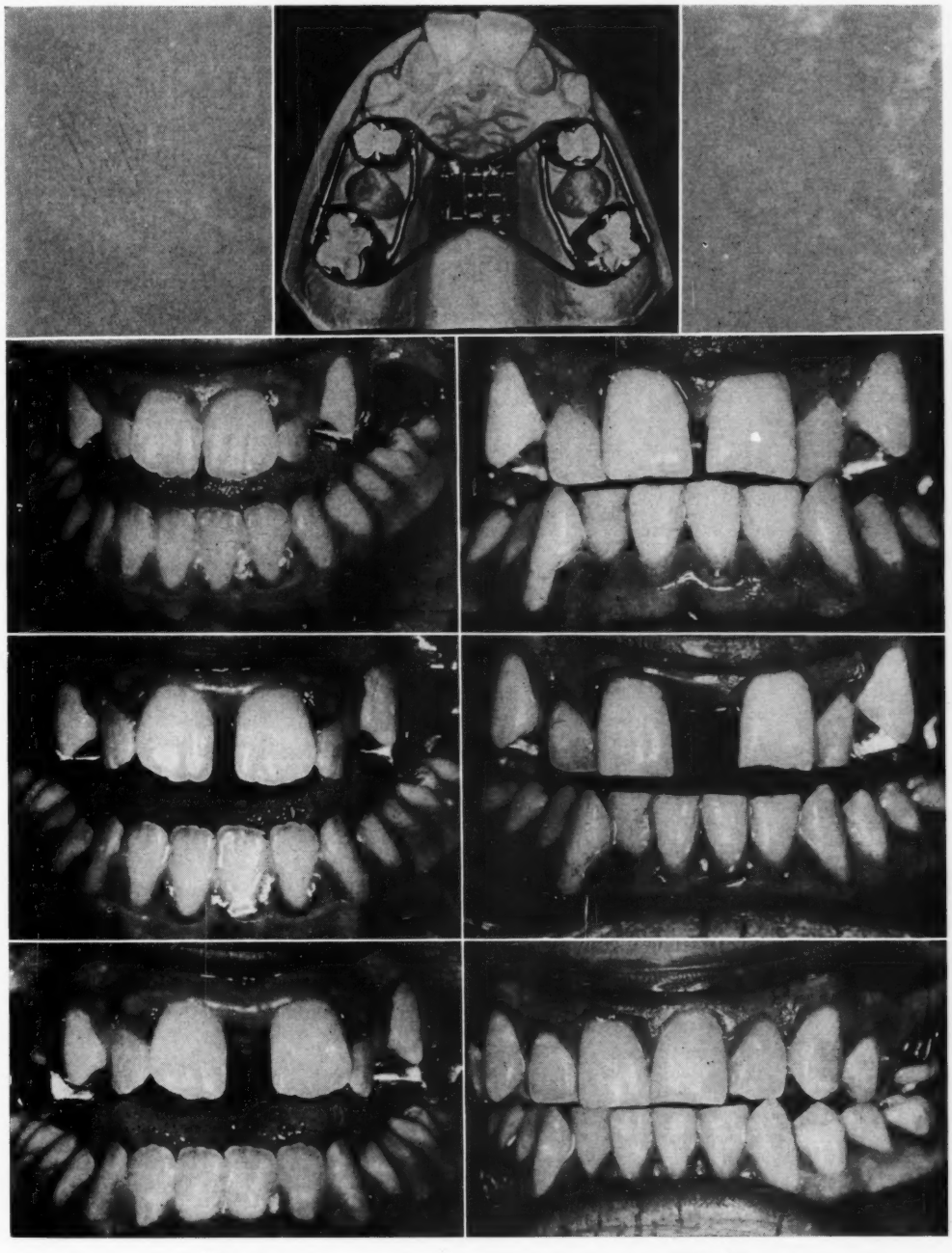


Fig. 22. Fig. 23.

Fig. 21.—Fixed appliance for the splitting of the median palatine suture.

Fig. 22.—Patient G. I., a 12-year-old girl. *A*, With splitting appliance fitted at the beginning of treatment.

B, After 6 mm. expansion. Note appearance of the diastema of 2.5 mm.

C, After 11 mm. expansion. Diastema of 6 mm.

Fig. 23.—Patient G. II, a boy, 16 years old when splitting was commenced with a fixed plate (*A*).

B, After splitting 8 mm.

C, Position of the anterior teeth one and one-half years after splitting.

Fig. 24.

Fig. 25.

Fig. 24.—Patient G. H. Teleradiograph I, before splitting, showing extreme narrowness. Jan. 6, 1955.
Fig. 25.—Patient G. H. Teleradiograph II, after splitting 6 mm. March 3, 1955. Note bilateral fractures at the floor of the nose and straightening-out of the septum.

arches, the mandible, and the base of the skull in view of the complicated development of the individual case. Clinical experience, however, has shown that the orthodontic expansion of the upper arch can also exert a favorable influence on the development of the nasal cavity, so that mouth breathing can be replaced by nasal respiration. The entire transverse development of the middle face presumably also receives strong stimuli from the functional forces which are transmitted by the supports.

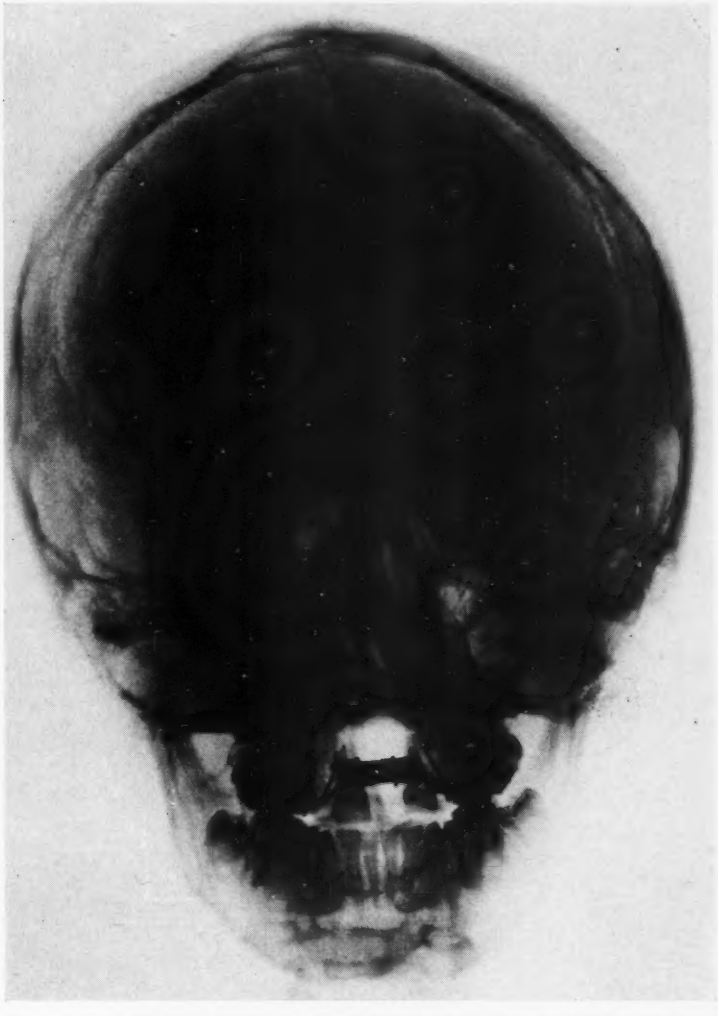


Fig. 26.—Patient G. II. Teleradiograph III, taken on March 12, 1955, after splitting 8 mm. (end of the widening).

Fig. 24.—Patient G. II. Teleradiograph I, before splitting, showing extreme narrowness. Jan. 6, 1955.
Fig. 25.—Patient G. II. Teleradiograph II, after splitting 6 mm. March 3, 1955. Note bilateral fractures at the floor of the nose and straightening-out of the septum.

WIDENING OF THE MEDIAN SUTURE OF THE PALATE

In some cases the buildup of the facial skull is so fragile and graceful that we must conclude that there is a general underdevelopment of the entire skeleton, and we must doubt whether the necessary high-grade expansion of the alveolar arches can be correlated to the build-up of the other parts of the facial skull. Some believe that in these cases extraction treatment is especially

Fig. 27.

Fig. 28.

Fig. 27.—Patient G. H. Teleradiograph IV, taken on April 4, 1955. The incisors fill the median split spontaneously during the retention period.

Fig. 28.—Patient G. H. Teleradiograph V, taken on July 20, 1956, at the end of the retention period. The incisors have adjusted themselves parallel to each other.

indicated. In such cases, however, the extraction treatment cannot achieve the aim of broadening the narrow nose passages and creating free nasal respiration. On the other hand, the widening of the median suture of the palate is a method which promises success in cases in which the purely biomechanical methods are not sufficient.

Fig. 29.

Fig. 30.

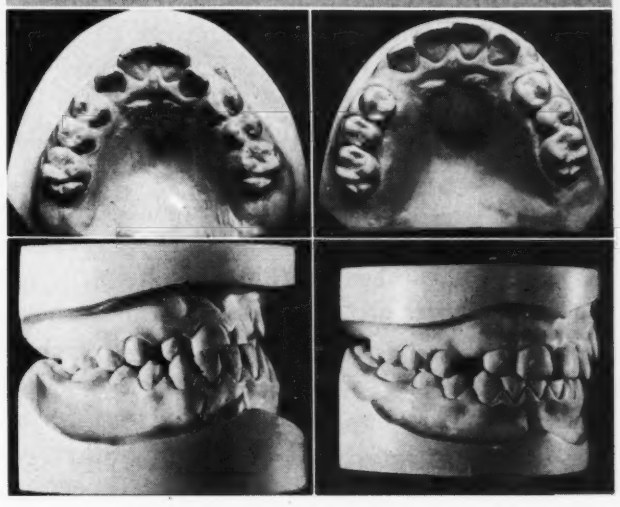


Fig. 31.

Fig. 29.—Patient G. II. Radiograph of the palate, taken at a steep angle, showing good bone formation.

Fig. 30.—Patient G. III, a 13-year-old boy. Before and after widening of the median suture.

Fig. 31.—Patient G. IV, a 12-year-old girl. Before and after widening of the median suture.

By means of an expansion screw which is placed as high up in the palate as possible and connected to the right and left buccal teeth, which are joined together in blocks, a very strong and frequently acting force is exerted by

taneously during the retention period.
Fig. 28.—Patient G. II. Teleradiograph V, taken on July 20, 1956, at the end of the retention period. The incisors have adjusted themselves parallel to each other.

turning the screw daily (Fig. 21). In this way the median suture of the palate, which during youth has not yet ossified, is separated and a gap appears between the middle incisors (Figs. 22, *B* and 23, *A*). This gap is subsequently closed by the deposition of new bone after a long period of retention.

The advocates of this system (Landsberger, 1907, Schröder and Benseler, 1913, Brown, 1914, Herbst, 1921, Huet, 1925, and Mela, 1933) claimed a speedy extension of the nasal cavities and an improvement of the frequently impeded nasal respiration. These observations have been confirmed recently by German authors, especially by Derichsweiler, by means of extensive practical examinations. During the May, 1953, congress of the Deutsche Gesellschaft für Kieferorthopädie in Bonn, this problem was discussed with nose specialists. Radiographs were shown, and it was established that the following consequences can be observed after splitting of the suture of the palate:

1. A broadening of the inner nose in a transverse direction.
2. An increase of the inner nose in a vertical direction.
3. In connection with this, fairly often, a straightening of the deviation of the septum.

It is clear that such a gain of space of the respiratory tract is very favorable for the substitution of mouth breathing by physiologic nasal respiration.

In Figs. 22 to 31 a few examples of splitting of the suture of the palate may be demonstrated. The splitting can take place in different ways, in some cases without a definite tear by expansion of the median suture (Fig. 20, *A*), in others with a double tear (Fig. 20, *B*), and in some with a one-sided tear (Fig. 20, *C*). The method is entirely painless, and so far unfavorable consequences have not been reported.

We European orthodontists are fully unanimous in the belief that this method is indicated only in cases of really high-grade compression of the maxilla. The duration of treatment is by no means shortened by this method, since in the lower arch the expansion and the other tooth movements are not affected and the ossification of the medium split requires some time. Nevertheless, it must be realized that a special advantage of this method lies in the extensive expansion which is not coupled with any individual tooth movements of importance.

We should pay special attention to all methods of orthodontic treatment which link an expansion of the jaws with an appropriate widening of the nose. During the course of our work, we should not pay so much attention only to the cosmetic peculiarities of the position of the teeth; rather, we should replace this purely orthodontic aim by the higher aims of orthopedics of the jaws and face. The extensively aided subsequent development of the jaws in all dimensions can be regarded, with full justification, as a valuable measure with far-reaching consequences.

(This is the second of a series of articles on present orthodontic thought in Germany. References will appear at the end of the final article.)

TREATMENT OF CLASS I MALOCCLUSION IN THE MIXED DENTITION

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IN THE permanent dentition, most of the objective elements upon which an exact diagnosis is based are apparent to the orthodontist. Thereafter, proper treatment planning leading to a successful result can easily be determined.

In the mixed dentition, however, there are many unpredictable qualities which make diagnosis difficult and prognosis and treatment planning uncertain. The principal unknown qualities are (1) the further development and growth of supporting bones and alveolar structures, the rhythm of which is unpredictable, as well as the amount, direction, and speed in time, and (2) the evolution of the dental arch, which depends upon the order and sequence of eruption of the unerupted permanent teeth and especially upon their size in relation to the deciduous teeth that they will replace. Bone growth and development and the evolution of the denture may be either favorable or unfavorable; thus, the malocclusion may improve or it may become more severe.

As a consequence, certain authors prefer to postpone treatment until all the deciduous teeth have been replaced by their permanent successors. In contrast to this concept is the contention of Dewel[3-7] that early treatment leads to a more successful result than if a malocclusion is permitted to develop into a fully matured irregularity in the permanent dentition. Early treatment also prevents tissue damage in the region of the malposed teeth, and it encourages normal behavior of the muscular tissues that surround the teeth.

On the other hand, many elements that contribute to malocclusion are not available in this transitional stage. Some of them may be predicted with reasonable accuracy, and others are absolutely unpredictable. In our opinion, successful correction of these cases requires sectional treatment. The first step is the *adjustment* of the maxillary and mandibular incisors within each arch as well as in their occlusal relations. The second step is adjustment of the buccal segments.

The typical example for such a procedure is found in Class I malocclusions. In these cases, early treatment is required not only for the foregoing reasons but also because ideal alignment of the incisors is best attained at an early

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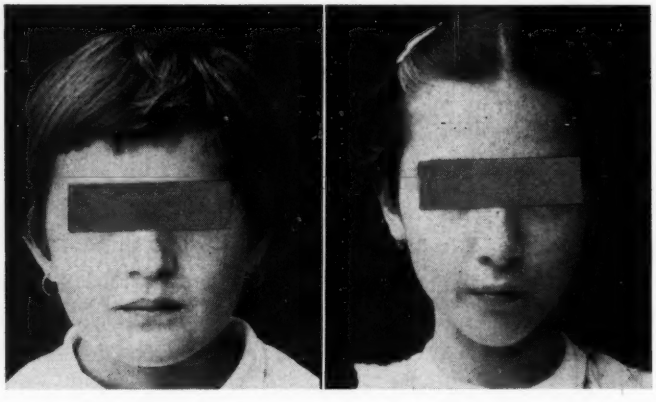
period, when osteogenesis is active in the anterior regions of the arches. If treatment is postponed, the teeth may be forced into positions that are not always stable.

Thus, treatment of these malocclusions is divided into two different and succeeding steps. In the first, the malposed anterior teeth are repositioned directly over basal bone; in the second, correction of the buccal segments is accomplished.

FIRST STEP IN TREATMENT

Crowding in Class I malocclusion is the result of a discrepancy between tooth size and arch development. Theoretically, it is clear that cases resulting from a deficiency in bone growth call for enlargement of the dental arches. On the contrary, cases resulting from excessive tooth size call for extraction.

In practice, however, the solution is not that simple; many problems arise which are not easily resolved. For example, the factor of *tooth size* and the factor of *deficiency in bone growth* combine, as a rule, in creating the malocclusion. Thus, with the exception of a few extreme cases, the diagnostic reasoning must be modified as follows: *Which of these two factors is predominant in provoking the crowding?*



A. *B.*

Fig. 1.—*A* shows an 8-year-old girl with a broad face and constitutionally large bony bases. *B* shows an 8-year-old girl with a narrow face and constitutionally small bony bases.

This discrimination is not easy, for it is difficult to determine the limits beyond which the teeth of a certain person must be considered to be too large. An example is illustrated in Fig. 1; teeth that are of a normal size for the girl with the broad face and large bony bases would be too large for the girl with the narrow face and constitutionally small bony structures.

Tooth size must be therefore judged with reference to the constitutional size of the supporting bone. As the width of the arches may be affected by several factors, pathologic or environmental, it is not useful to keep this width as a reference. The most advisable way to establish the normal individual tooth size is to relate the size of the front teeth to the width of the face. We would not state that there is always a high correlation between width of the face and size of the front teeth. When we are dealing with a crowding case in the mixed

dentition, however, this determination seems the most reliable criterion to apply. For this purpose, a table has been made in which the value of the size of the front teeth (sum of the mesiodistal diameters of the maxillary incisors) ideally corresponding to each value of the bizygomatic width can be read immediately. This table has been made according to a mean among the available data on the face width and dental size variations in the European and American literature.

TABLE I

BIZYGOMATIC WIDTH (MM.)	IDEAL INCISOR SIZE (MM.)	BIZYGOMATIC WIDTH (MM.)	IDEAL INCISOR SIZE (MM.)
101	27.3	115	31.1
102	27.5	116	31.3
103	27.8	117	31.6
104	28.1	118	31.9
105	28.4	119	32.1
106	28.6	120	32.4
107	28.9	121	32.7
108	29.2	122	33.0
109	29.4	123	33.2
110	29.7	124	33.5
111	30.0	125	33.8
112	30.2	126	34.0
113	30.5	127	34.3
114	30.8	128	34.6

In columns 1 and 3 are reported the values of the bizygomatic width. Columns 2 and 4 show the ideal corresponding values of the sum of the mesiodistal diameters of the upper incisors. These values can be applied to the age of 7 years. Owing to the age changes in the bizygomatic width, 2 mm. at 8 years, 4 mm. at 9 years, and 5 mm. at 10 years must be subtracted from its actual value.

In this manner, we are able to determine whether the lack of space for the incisors is due to excessive tooth size or to a deficiency in bone growth. It is also an aid in determining to what extent each factor is responsible for the irregularity.

The procedure we suggest is as follows: First, the actual size of the maxillary incisors is compared with their ideal size for the patient examined and, second, the lack of space for the maxillary incisors is determined. This is obtained from the difference between the sum of the mesiodistal diameters of the incisors and the available space in the arch. This latter is checked by measuring the space existing for each incisor in its proper position. It is advisable to take as a reference point the least malposed tooth and to proceed from this to a measurement of the partial spaces.

As far as tooth size is concerned, the two measurements may coincide, or the actual size of the incisors may be found to be slightly smaller than the ideal (Fig. 2). Here it is clear that all the loss of space is the result of a deficiency in bone growth; therefore, anterior expansion of the arch is indicated.

In other cases, the actual size of the incisors may be greater than the ideal measurements. When this occurs, the excess millimeters in tooth size must be subtracted from the lack of space value. The difference indicates how much deficiency in bone growth is present. When the lack of space value and the excess millimeters in tooth size correspond exactly, all the loss of space must be considered to result from excessive tooth size.

In Fig. 3, the actual size of the incisors is greater than the corresponding ideal value by a total of 3.2 mm. The lack of space is 8 mm. The difference

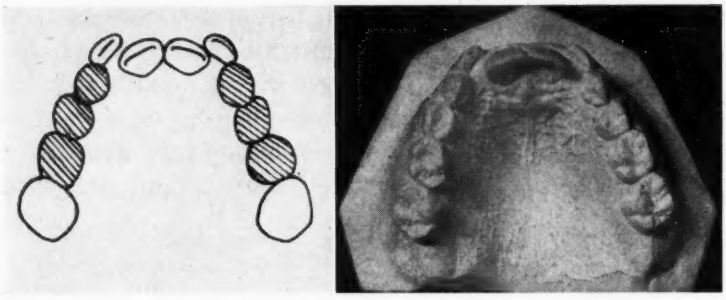


Fig. 2.—Girl, aged 8 years. Bizygomatic width, 116 mm.; incisors, 30.5 mm. (ideal size, 30.8 mm.); lack of space, 8 mm.; deficiency in bony growth, 8 mm.

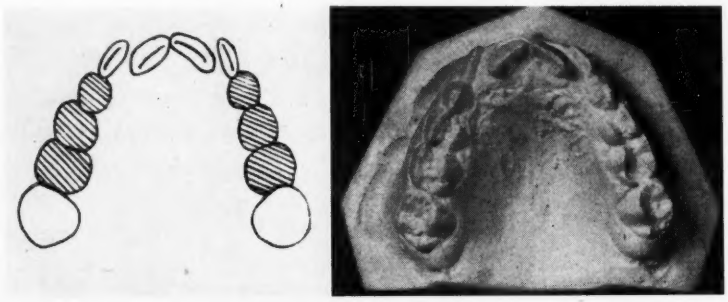


Fig. 3.—Girl, aged 8 years. Bizygomatic width, 116 mm.; incisors, 34 mm. (ideal size, 30.8 mm.); exceeding tooth size, 3.2 mm.; lack of space, 8 mm.; deficiency in bony growth, 4.8 mm.

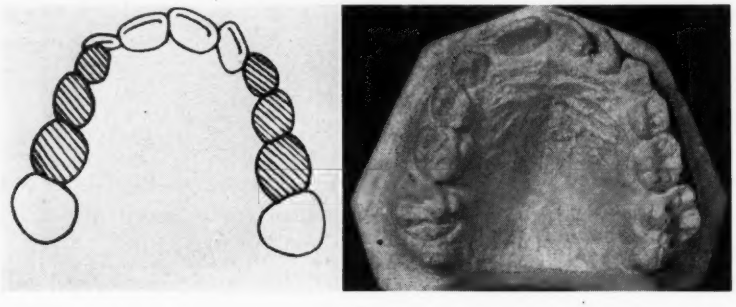


Fig. 4.—Boy, aged 8 years. Bizygomatic width, 119 mm.; incisors, 37 mm. (ideal size, 31.6 mm.); exceeding tooth size. 5.4 mm.; lack of space, 9 mm.; deficiency in bony growth, 3.6 mm.

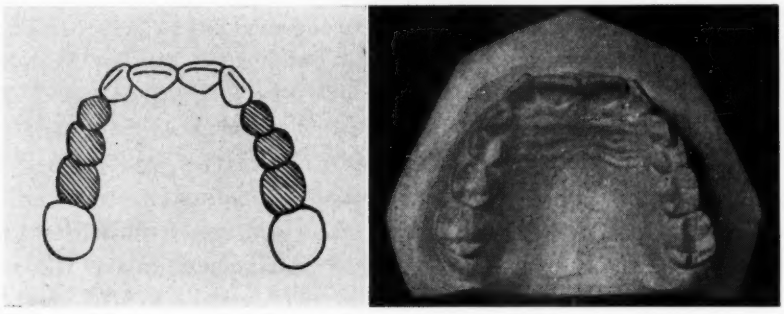


Fig. 5.—Girl, aged 8 years. Bizygomatic width, 115 mm.; incisors, 33 mm. (ideal size, 30.5 mm.); exceeding tooth size, 2.5 mm.; lack of space, 2.5 mm.; no deficiency in bony growth.

between these two measurements is 4.8 mm., and this in turn records the extent of the deficiency in bone growth.

Deciduous cuspids are removed when excessive tooth size is present and the lack of space amounts to 3 mm. or more (Fig. 4). When space loss is 2.5 mm. or less, space for the incisors is provided by anterior expansion. Under these circumstances, a limited widening of the arch is considered to remain within the so-called "limits of tolerance" (Fig. 5).

Dewel[3, 7] has also focused our attention on other special conditions that require the preliminary removal of the deciduous cuspids. These are (1) gingival recession and alveolar resorption labial to one or more of the lower incisors, (2) a shift in median line due to early loss of one of the deciduous canines, and (3) blocked-out lateral incisors, their room in the arch being reduced to one-half or more of the required space.

After extraction of the deciduous canines, a multiband or simplified band appliance is placed to reposition the malposed incisors. Fig. 6 illustrates the successive steps in the correction of an incisor crowding due to excessive tooth size.

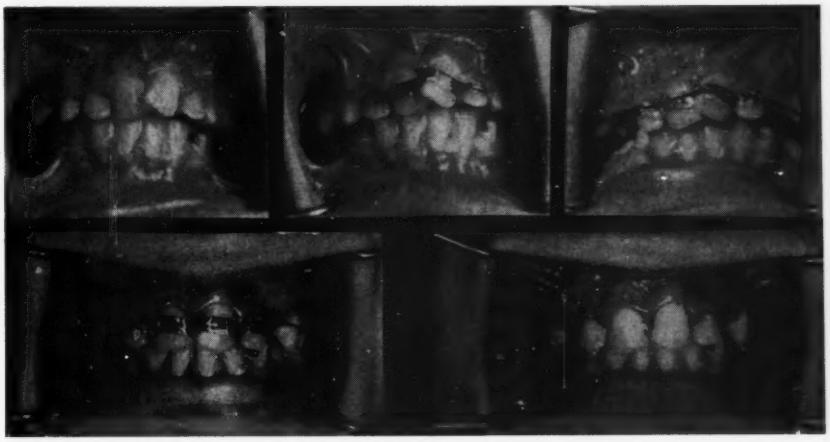


Fig. 6.—Succeeding steps in the correction of an incisor crowding due to an excessive tooth size. Deciduous cuspids are removed and a twin arch applied.

It must be quite clear, however, that when we speak of deciduous canine extraction to permit the alignment of the incisors we do not necessarily mean to advise serial extraction. In many of our cases removal of the deciduous canines has not been followed by extraction of other deciduous teeth. Instead, a complete correction of the malocclusion has often been achieved with a full complement of permanent teeth.

This occurs especially in the lower arch, where the more favorable "leeway" space permits the deciduous cuspids to be removed in a large number of cases in order to obtain an adjustment of the incisors in their proper positions over basal bone. To prevent the permanent first molars from drifting mesially, a lingual supporting arch is placed.

When the alignment of the incisors is to be obtained by enlarging the anterior region of the arch, the device that we prefer is a plate supplied with a strong U-shaped spring and a posterior hinge that produces a fanlike action (Fig. 7). The plate should be extended to the lingual surfaces of the lower teeth and to the alveolar process. However, the action of such a plate in the mandibular arch is almost always less extensive than in the maxillary arch. For this reason, in cases in which the lower teeth are severely crowded, we prefer,

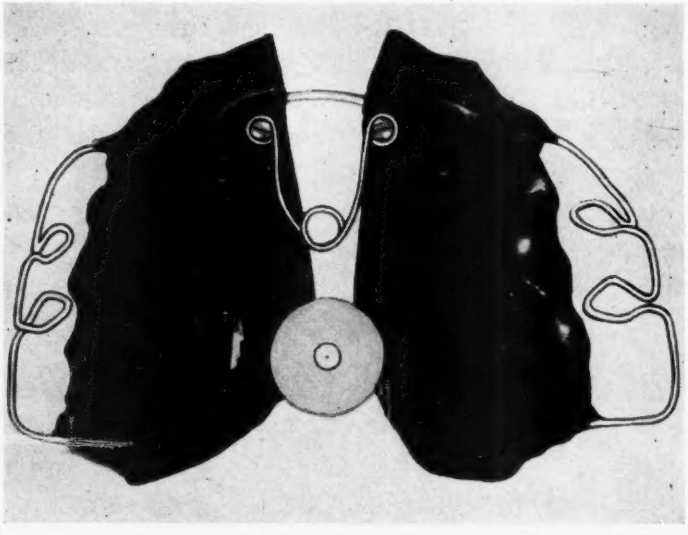


Fig. 7.—Plate with fanlike action for the anterior expansion.

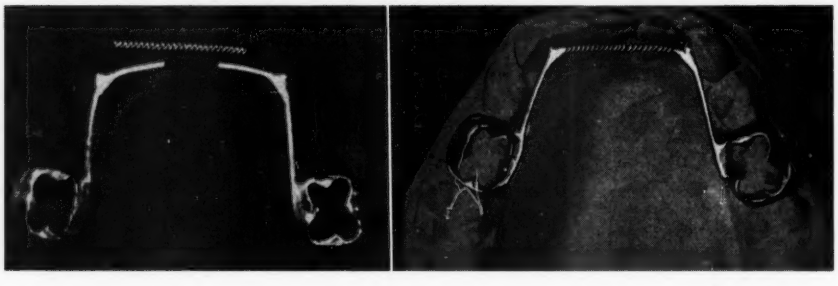


Fig. 8.—Appliance used for the anterior expansion in the lower arch.

to enlarge the lower arch independently of the upper arch. Numerous devices are proposed for this purpose. For many years we have been using a lingual arch cut in the middle and supplied with an expansion coil spring. Two stops soldered close to the mesiolingual angle of the deciduous canines permit the spring to be compressed (Fig. 8). The results are very satisfactory, as demonstrated in Figs. 9 and 10.

In the mandible, improvement in incisor alignment usually takes place spontaneously during the expansion of the anterior portion of the arch. The upper incisors, however, generally must be repositioned after having obtained sufficient space in the maxillary arch.

SECOND STEP IN TREATMENT

Except in a minority of cases, the alignment of the incisors is not to be considered the end of treatment, since the reduction in arch length still remains to be corrected (Fig. 11). This shortening is generally more extensive in the maxillary arch than in the mandibular arch because of the smaller size of the upper deciduous molars as compared to the lower deciduous molars. Further-

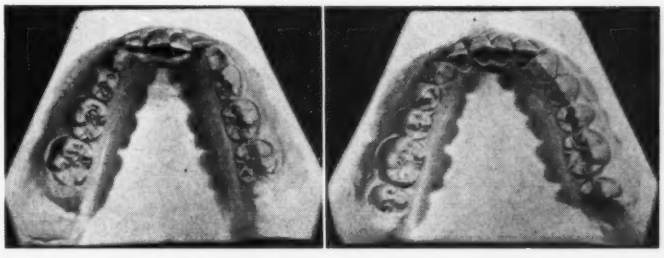


Fig. 9.—Lower incisor crowding treated by anterior expansion. Left, the beginning; right, three years after treatment. Bicanine breadth has increased 3 mm.

Fig. 10.—Lower incisor crowding treated by anterior expansion. Left, the beginning (bicanine breadth, 26.4 mm.); center, the end of active treatment (bicanine breadth, 29.5 mm.); right, three years after treatment (bicanine breadth, 28.5 mm.). The bimolar breadth has remained undisturbed.

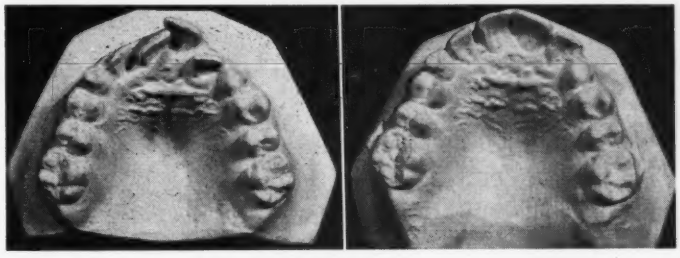


Fig. 11.—Crowding case at the beginning (left) and at the end of the first step of treatment (right). The incisors have been repositioned. Arch shortening has still to be corrected; this will constitute the second step of treatment.

more, the often unfavorable order of eruption of the maxillary permanent premolars and canines also plays a role. This second step is devoted to the adjustment of the buccal segments wherein either conservative or radical treatment procedures may be required. In this discrimination, basic importance is given to the conditions existing in the mandibular arch, which therefore is the guide arch in treatment.

To a certain extent, an increase in arch length can be secured in the maxillary arch; this is due to an increase in depth of the anterior portion of the

maxillary arch as well as to distal movement of the first permanent molars. It is not possible, however, to increase mandibular arch length. Nance[12] has demonstrated that arch level length mesial to the first permanent molars will definitely decrease in the mandible between the mixed dentition and the permanent dentition. Speck,[14] Björk,[2] Seipel,[13] Moorrees,[11] and Foster and Wylie,[8] have substantiated this finding in their studies. This final reduction in length of the mandibular arch tends to take place also when the original length has been increased by orthodontic treatment.

Fig. 12.—Girl, aged 7 years 1 month. Models at the beginning of treatment and five years later, at the end of retention. In the maxillary arch, bicanine breadth has increased 3 mm., bimolar breadth has increased 2.5 mm., and the depth of the anterior arch has increased 4.5 mm. In the mandibular arch, bicanine breadth has increased 3 mm., bimolar breadth has increased 1.7 mm., the depth of the anterior arch has increased 2.1 mm.

It is not possible to apply different therapeutic procedures in the two arches, that is, to move the upper posterior teeth distally and to extract in the lower arch. This would create a dangerous disturbance in the interdigitation of the buccal segments. *We therefore must subordinate the treatment procedure in the upper arch to what can be done in the mandibular arch.*

In other words, it is necessary at present to calculate in each individual case Nance's "leeway" in the lower arch. To determine the size of the permanent canines and premolars, we associate the radiographic investigation to the mathematical calculation proposed by Ballard and Wylie.[1] If the available space is greater than the required space, the proper procedure is to increase maxillary arch length. In the meantime, mesial drifting of the lower first permanent molars is prevented. If, however, the available space is less than normal, either radical treatment should be postponed until the permanent dentition has erupted or serial extraction procedures should be undertaken.

Fig. 13.—Girl, aged 7 years 8 months. Models at the beginning of treatment and five years later, at the end of retention. In the maxillary arch, the bimolar breadth has increased 3 mm., and the depth of the anterior arch has increased 0.5 mm.

When conservative treatment is indicated, the procedure in the upper arch depends primarily upon occlusal relationships of the molars. In those cases in which the first permanent molars are in normal occlusion and all the deciduous teeth are present and free from proximal caries, a simple lingual supporting arch which prevents the first permanent molars from drifting mesially should be sufficient. If the molar relationship is one of neutroclusion and the deciduous molars are missing or largely destroyed, Kloehn's[9] method of moving the upper

first permanent molars distally is applied. In our opinion, it is preferable to apply moderate force and to delay it until the permanent canines and premolars are completely settled. An eventual exaggeration in the distal movement of the upper first permanent molars is of little concern, since it is usually self-corrective.

Fig. 14.—Girl, aged 9 years 2 months. Models at the beginning of treatment and two and one-half years later, at the end of retention. In the maxillary arch, bimolar breadth has increased 5 mm., and the depth of the anterior arch has decreased 2.5 mm. In the mandibular arch, bicanine breadth has increased 2 mm., bimolar breadth has increased 5 mm., and the depth of the anterior arch has remained undisturbed.

At this point, an objection may be raised: Why divide treatment into two periods, independent of each other and with a treatment procedure based on different criteria? Would it not be simpler and easier to determine the "leeway" from the beginning and to plan the treatment accordingly? Many excellent orthodontists do so. They start from the premise that any orthodontic enlargement or lengthening of the arch mesial to the first permanent molars is an illusion. They therefore give up a priori any attempt to make space for the crowded incisors by means of expansion.

We disagree with this concept. Indeed, long clinical experience shared by a large number of European and American orthodontists has shown that some extension of the anterior segment of the alveolar arch can be successfully achieved. It occurs in the early period of the mixed dentition during which the eruption of the incisors takes place, or immediately thereafter. The cases

Fig. 15.—Girl, aged 7 years 5 months. Models at the beginning of treatment and five years after retention was discontinued. In the maxillary arch, bicanine breadth has increased 5 mm., bimolar breadth has increased 8.2 mm., and the depth of the anterior arch has not changed. In the mandibular arch, bicanine breadth has increased 4.7 mm., bimolar breadth has increased 7.6 mm., and the depth of the anterior arch has increased 1 mm.

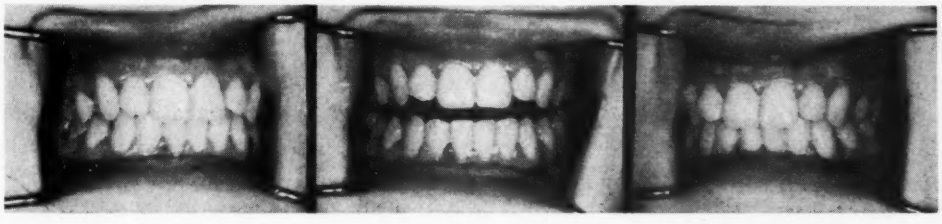


Fig. 16.—Photographs of the case shown in Fig. 15, taken seven years after the retention was discontinued.

illustrated in Figs. 12, 13, 14, 15, and 16 show that the correction has been obtained mainly by an eccentric growth in the anterior region of the arches, which appear to be increased in breadth and depth.

The orthodontic stimulus is able not only to provoke additional alveolar growth but also to reactivate the osteogenetic power of the intermaxillary suture.

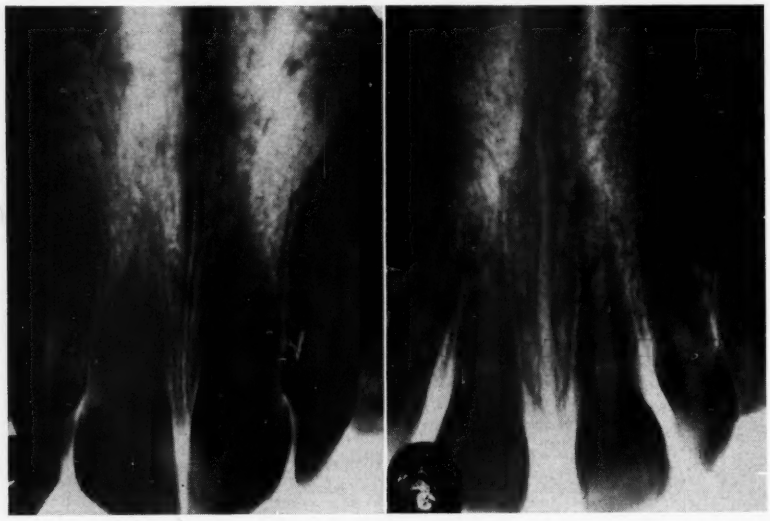


Fig. 17.—Formation of a rima in the midsagittal suture owing to anterior expansion (right). The V-shaped rima affects the suture just to the posterior third of the hard palate.

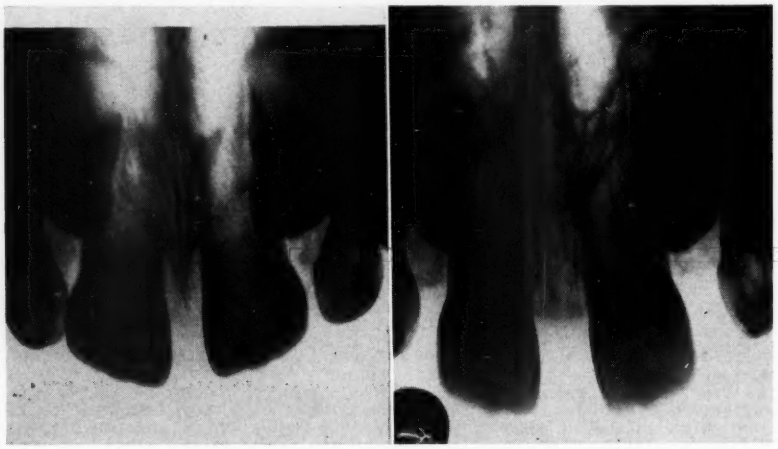


Fig. 18.—The rima produced by therapeutic disjunction of the intermaxillary suture (right) appears occupied by new-formed bone.

Therapeutic disjunction in the anterior part of the suture, as a result of the application of a plate with a fanlike action, can be seen in Figs. 17 and 18. The first radiogram, taken immediately after expansion was obtained, shows that a rima between the upper maxillary bones has been produced; in the other, the rima appears occupied by newly formed bone.

The anterior expansion of the arch, although it generally permits the proper alignment of the incisors, does not exclude the fact that in many cases

extraction will be necessary later on to correct the lateral segments. However, it remarkably reduces the number of these cases, and in the more severe irregularities it achieves better anatomic results.

We have no hesitation in extracting whenever extractions are necessary in order to place the teeth in their proper positions over basal bone and to reach a balanced occlusion. However, we do not prescribe serial extraction in those cases in which alveolar growth increments can be successfully stimulated and a good, long-lasting correction can be achieved with a full complement of teeth.

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THE ADVISORY COMMITTEE ON ORTHODONTICS IN THE PUBLIC HEALTH PROGRAM*

By the Advisory Committee on Orthodontics

Franklin A. Squires, D.D.S. (Chairman), J. A. Salzmann, D.D.S., Ashley E. Howes, D.D.S., and Walter R. Bedell, D.D.S.

OUR experience as the Advisory Committee on Orthodontics to the Bureau of Dental Health of the New York State Department of Health could well prove of value to others elsewhere when called upon to serve in a similar capacity. We consider it a fortunate circumstance that Dr. David B. Ast, Director of the State Health Department's Bureau of Dental Health, with whom we have cooperated during the last 14 years, evidenced from the very beginning of our association a deep understanding of the public health implications of orthodontics and of the value of this service to the child who needs it.

We have felt at all times during our service as an Advisory Committee that the aims and purposes of the Bureau of Dental Health were of great benefit not only to the children of the State of New York but were also in keeping with the highest aims of orthodontics. It gave our specialty definite status as a public health activity.

COMMITTEE FUNCTIONS

Instead of telling us what we were expected to do, the Bureau of Dental Health invited the Advisory Committee to cooperate with it in establishing the functions of the Committee itself. These included:

1. To advise the Department concerning the classification of handicapping malocclusions and whether or not selected patients fit into this classification.
2. To advise the Department as to training and experience necessary to qualify orthodontists for participation in the state aid program, and to advise concerning qualifications of individual applicants.
3. To advise the Department concerning an equitable fee scale for orthodontists.

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*The original Advisory Committee consisted of Leuman M. Waugh, D.D.S., Chairman; Franklin A. Squires, D.D.S.; J. A. Salzmann, D.D.S.; Joseph D. Eby, D.D.S.; and the late Harry U. Barber, D.D.S., who was succeeded by Lowrie J. Porter, D.D.S.

4. To review problem cases at periodic intervals and to advise the Department concerning the progress of treatment.

5. To advise the Department as to orthodontic educational programs and material for professional personnel, including dentists, physicians, nurses, dental hygienists, and other interested health personnel.

6. To prepare instructions to orthodontists re progress of treatment, preparation of diagnostic aids, etc.

After our functions were defined, the State Health Department requested our cooperation in establishing the criteria of malocclusion and dentofacial deformities to be treated under the state aid orthodontic program. In other words, the Advisory Committee, consisting of practicing orthodontists, was asked to assist the State in determining what types of malocclusions may be considered physically handicapping and would warrant the expenditure of public funds for their treatment.

Orthodontics as a public health function received further recognition when it was defined in 1948 by the U. S. Children's Bureau of the Department of Health, Education and Welfare as follows: "The correction of dentofacial deformities when efficiency of the dental mechanism is threatened by a present or potential condition which will cause tissue injury or interfere seriously with function or with mental or physical development."

One of the recommendations of the Children's Bureau calls for "immediate service programs for children with severe dentofacial deformities, especially those with general health, psychosomatic and employability involvements." In establishing service programs the Children's Bureau advise that ". . . state health departments undertaking orthodontic programs should appoint advisory committees, preferably nominated by the district orthodontic society." The foregoing recommendations conform to the procedure which had already been established in the State of New York.

The American Association of Orthodontists, through its Committee on Public Health, established a record of cooperation with public health, educational and welfare authorities. To cite a few examples, the Association participated in the 1950 American Public Health Association in formulating a guide for public health personnel, which it published in 1955, on "Services for Children With Dentofacial Handicaps." The American Public Health Association Guide states that "Since orthodontic care is often the principal service in programs for dentofacial handicaps, there should be a special advisory committee of orthodontic specialists, preferably members of the American Association of Orthodontists, who are certified by the American Board of Orthodontics." The foregoing is in keeping with the practice followed by the New York State Department of Health.

BORDERLINE CONSIDERATIONS

It is the opinion of the Advisory Committee based on our many years of experience that, in the administration of public health orthodontic service

programs, consideration should be given to the borderline where individual or family dental responsibility stops and where public health and social service initiative and procedure begin. As pointed out in the American Public Health Association Guide, "Although the severity of the physical abnormality usually determines the degree of handicap, there are other factors which may greatly affect the extent of the disability. A relatively minor malformation may sometimes cause serious handicap because of secondary difficulties that arise, such as inadequate social or emotional adjustment, unequal educational or vocational opportunities, or poor physical health."

The Advisory Committee is happy to state that in the conduct of the Orthodontic Program of the State of New York, the above mentioned considerations have never presented any difficulty. We have gained much experience in the situations that confront public health authorities but which seldom present themselves in private practice. While the State has always deferred to the Advisory Committee on professional standards, the Committee in no way presumed to inject itself in matters dealing with public health procedure.

SPECIAL PROBLEMS

We wish to summarize the following as special problems, most of which have been solved in the Orthodontic Program of the State of New York, but which we believe may present themselves anew wherever public health orthodontic programs are undertaken:

1. The degree of perfection that should be expected in a public health orthodontic program. In New York State we feel that the results obtained are comparable to those prevailing in private practice, as far as adequate function and esthetics are concerned.

2. Preventive orthodontics today is largely among the undefinables. More effort is required in this area.

3. Degree of severity of the malocclusion to be treated in relation to the personality of the patient. In addition to the orthodontist, this requires the cooperative efforts of the social worker, psychologist, psychiatrist, speech therapist and others.

4. Fees for treatment. The fees paid private orthodontists who treat children under the New York Program are considered adequate.

5. Retention. Consideration should be given to retention from the standpoints of length of time required, services rendered, and costs involved.

6. Qualification of operators. Members of the American Association of Orthodontists are eligible to treat patients under the program. Those qualified for such membership but who do not belong to the A.A.O. must show proof of ability to perform satisfactorily this type of service. State Health authorities, with the assistance of the Advisory Committee, make an appraisal of these qualifications and, if

found satisfactory, add the applicant to the list of qualified operators who may treat patients under the state-aid-to-county dental rehabilitation program.

7. No practicing orthodontic specialist should, in his own office, have a case load of state-aid cases which would practically exclude private practice.

8. Education on the relationship between the dentist, the patient, the patient's parents, the school authorities, etc., is important to the success of the orthodontic rehabilitation program.

9. Cooperation with the dentist. While the child is undergoing orthodontic treatment, his teeth should receive constant supervision and care of his general dental needs.

In conclusion, we take pleasure in saying that our association with the program has been a highly rewarding experience.

In Memoriam

JOHN DOYLE

JOHN DOYLE, aged 50, died on May 24, 1959, at his home in Traverse City, Michigan, after an illness of several years.

Dr. Doyle was born in Negaunee, Michigan, and graduated from high school in that same city in 1927. He received his A.B. degree from Northern State Teachers College in 1941. He earned his D.D.S. in 1944 at the University of Michigan, where he later served as clinical instructor for one year. He received his M.S. in orthodontics from Michigan in 1948, and he proceeded to practice orthodontics in Traverse City from that time until he became incapacitated.

Dr. Doyle's professional activities included membership in the American Dental Association, the Michigan State Dental Association, the Resort District Dental Society (of which he was president in 1950), the American Association of Orthodontists, and the Great Lakes Society of Orthodontists.

The Immaculate Conception Church of Traverse City and the Kiwanis Club have lost a valued member with the passing of Dr. Doyle.

Dr. Doyle is survived by his widow (the former Beatrice Thebodeau), two sons, two daughters, his parents, two brothers, and two sisters.

This well-liked and highly respected person was laid to rest at Traverse City cemetery in Michigan.

May it be resolved that this resolution be made a permanent part of the official records of this Society and a copy be sent to the family.

NECROLOGY COMMITTEE
GREAT LAKES SOCIETY OF ORTHODONTISTS

Robert R. McGonagle, Chairman
Mason E. Seibel
Charles H. Meinhold

RUSSELL E. HUBER

RUSSELL E. HUBER died on Aug. 26, 1959, at the age of 50.

He was born in Dayton, Ohio, and attended the local school. Dr. Huber graduated from the University of Dayton and attended the University of Michigan Dental School, graduating in 1932. After interning at Miami Valley Hospital for two years, he returned to his hometown of Dayton, where he

opened an office for the general practice of dentistry in 1934. He returned to the University of Michigan in 1941 for orthodontic training and received his master's degree in 1943. He remained on the faculty at the University of Michigan until 1945, when again he returned to Dayton to practice orthodontics.

He was a member in good standing of the local, state, and national dental societies. He was also a member of Delta Sigma Delta fraternity. He was certified by the American Board in Orthodontics in 1951. He was, of course, a highly valued member of the Great Lakes Society of Orthodontists, serving on the Board of Censors. His interest in cleft palate rehabilitation was well known throughout the country.

Dr. Huber, an avid sportsman, enjoyed hunting, fishing, and working the fields with his dog.

Dr. Huber's wife, the former Louise Kislig, died in 1958. He is survived by his 13-year-old daughter, Cynthia, his mother, and one brother.

We need not belabor the fact that this Society will greatly miss Russell Huber.

Be it resolved that the Society place a resolution listing our loss on record and that an appropriate message of sympathy be sent to the family.

NECROLOGY COMMITTEE
GREAT LAKES SOCIETY OF ORTHODONTISTS

Robert R. McGonagle, Chairman
Mason E. Seibel
Charles H. Meinhold

Department of Orthodontic Abstracts and Reviews

Edited by
DR. J. A. SALZMANN, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City.

Abstracts of Papers Presented Before the Research Section of the American Association of Orthodontists, Detroit, Michigan, May 3 to 7, 1959

A Roentgenographic Cephalometric Study of the Tongue: By Donald F. Eifert, University of Michigan, Ann Arbor, Michigan.

This is a study of tongue position in sixty-eight children with an average age of 16 years. A total of ninety-one profile cephalograms taken at 120 peak kilovolts were traced at rest and occlusion. These cephalograms were utilized to make linear measurements, sagittal section area measurements, and observations of tongue position. No foreign objects or materials were introduced into the oral cavity; nor were any commands given which might have altered tongue position. Double determinations were done on eighteen of the samples.

The following conclusions were derived from the study:

1. Males were significantly larger in size than females in the following measurements:
   (a) Mandibular length
   (b) Mandibular body length
   (c) Total available area for tongue to occupy
   (d) Sagittal sectional area of the tongue
   (e) Pharyngeal space
2. Females were significantly larger in size than males in the following:
   (a) Area of the tongue above the occlusal plane
   (b) High point of the tongue above the occlusal plane
3. A high correlation exists between tongue area and mandibular length and tongue area and available area for the tongue in both males and females.
4. The normal tongue position in the study showed the dorsum to have varying degrees of convexity, the female tongue generally being higher and occupying more area above the occlusal plane. The relationship of the tip of the tongue to the mandibular incisors varied—as many were above the tip of the incisors as below.
5. The soft palate did not touch the dorsum of the tongue in approximately one-third of the sample when the mandible was in its postural position.
6. No relationship appears to exist between the lips being parted or closed and the position of tongue to soft palate in the rest cephalograms.

7. The high point of the tongue was in general posterior to $\underline{6}$. Ten females and one male showed this to be at $\underline{6}$. In no older cases was the high point anterior to $\underline{6}$.
8. There is some indication that sagittal sectional tongue area and available area for the tongue, as measured in this study, increase between the ages of 9 and 16.

611 South Missouri
Clearwater, Fla.

A Cephalometric Analysis of Selected Skeletal Areas of Children Exhibiting Class I and Class II Malocclusions: By Frank E. Thomas, College of Dentistry, University of Washington, Seattle, Washington.

Lateral head roentgenograms of fifty male children were selected from the files of the University of Washington Orthodontic Department. The films of twenty-five children were representative of Angle's Class I malocclusion and those of the other twenty-five were representative of Angle's Class II malocclusion.

The first films of each person were taken in the age range from 10 to 12 and the second films for each person were taken in the age range from 15 to 16.

The area selected for study is the palatal plane, cranial base planes, and the area that lies between these planes.

A series of five triangles connecting various anatomic points and landmarks were used to evaluate the area.

In one phase of the experiment the triangles were studied in total so that the various points could be related to one another. These triangles were studied on the basis of change from the first to the second films, for both the Class I malocclusions, and for the Class II malocclusions. A chi-square test was performed to determine if there was a significant difference between the Class I and Class II malocclusions.

The second phase of the experiment involved a direct comparison of individual angles of the triangles of the Class I malocclusions and the Class II malocclusions. This is done for both the first and second group of films. The unpaired "t" test was used to assess the level of significance.

In the general conclusions it appears there is no significant difference between this group of Class I and Class II malocclusions regarding the area studied.

2121 North 88th St.
Seattle, Wash.

News and Notes

American Association of Orthodontists

The fifty-sixth annual session of the American Association of Orthodontists will be held April 24 to 28, 1960, at the Shoreham Hotel in Washington, D. C.

Arrangements are proceeding quite satisfactorily for this first annual session of the new decade. Your officers are making every effort to see that your time will be well spent.

The scientific program is outstanding. Great care has been taken to select essayists, clinicians, and discussion leaders from here and abroad. Their presentations should be instructive, provocative, and even inspirational. The essay, registered clinic, general clinic, research, and round-table programs are being arranged so as to give you a rare opportunity to share and discuss mutual problems with the world's leading orthodontists.

Because beautiful Washington is the host city, the sightseeing and social activities are unusually attractive. There will be a conducted tour of the city on Sunday afternoon and a trip to Mount Vernon, Alexandria, and Christ Church on Monday. The ladies will have a specially arranged style show and luncheon on Tuesday, and there will be continental breakfasts on both Monday and Tuesday. We all will enjoy the Sunday night reception honoring our guests from abroad and the candlelight buffet that follows, as well as the President's reception and dinner-dance on Wednesday night.

Hotel facilities are excellent. In addition to the Shoreham, arrangements have been made with the Sheraton-Park Hotel and other hotels that are quite close. Because of the unprecedented demand for rooms, it would be wise to make your reservations immediately.

In keeping with the importance of the meeting, because of the expected large attendance, and in order to help you gain the most possible from each contribution, closed-circuit television will augment the usual meeting facilities.

For a profitable, educational, and socially delightful experience, complete your plans now for Washington in '60!

Program Outline

Monday, April 25

OPENING OF THE SESSION (Terrace Room and West Ballroom)

9 A.M. Official Opening of the Meeting. President George M. Anderson.

Invocation. The Rev. Dr. Graham Gordon Lacy, Minister, Central Presbyterian Church, Washington, D. C.

Official Greetings to Guests From Abroad. Hon. Francis O. Wilcox, Assistant Secretary of State.

Greetings, American Dental Association. C. Willard Camalier, Director, Washington Office.

Address of Welcome. Hon. Robert E. McLaughlin, President, Board of Commissioners, District of Columbia.

Response. William R. Humphrey, President-Elect, American Association of Orthodontists.

President's Address. George M. Anderson.

SCIENTIFIC MEETING (Terrace Banquet Room and West Ballroom)

Honorary Presiding Officer: Hugo Thorne, President, Swedish Orthodontic Society.

Presiding Chairman: T. M. Graber, General Chairman, 1960 Session.

10 A.M. The John V. Mershon Memorial Lecture.
Introduction by John W. Ross.
PROFESSIONAL AND PUBLIC RELATIONS. C. Edward Martinek (U. S. A.)

11 A.M. ASYMMETRIES OF THE TEETH, DENTAL ARCHES, JAWS, AND SKULL AND THEIR ETIOLOGICAL SIGNIFICANCE. Anders Lundström (Sweden).

12:15 P.M. Golden Anniversary Luncheon (Charles R. Baker presiding). Blue Room. Guest speaker: Sheldon Friel (Ireland).

2:15 P.M. Albert H. Ketcham Memorial Awards.
Presentation by L. Bodine Higley, President, American Board of Orthodontics.
Recipients: Sheldon Friel, Dublin, Ireland, and Charles H. Tweed, Tucson, Arizona.

The Shoreham Hotel in Washington, D. C. where the American Association of Orthodontists will hold its next annual meeting, April 24 to 28, 1960.

SCIENTIFIC MEETING (Terrace Banquet Room and West Ballroom)
Honorary Presiding Officer: Olav Slagsvold, President, Norwegian Orthodontic Society.
Presiding Chairman: Paul V. Reid, Program Chairman.

3:15 P.M. RELEGATING TO APPLIANCES THEIR PROPER PLACE IN TREATMENT. Oren A. Oliver (U. S. A.).

4:15 P.M. TISSUE BEHAVIOR DURING ORTHODONTIC TOOTH MOVEMENT. Kaare Reitan (Norway).

Tuesday, April 26

SCIENTIFIC MEETING (Terrace Banquet Room and West Ballroom)

Honorary Presiding Officer: H. T. A. McKeag, President, European Orthodontic Society.

Presiding Chairman: A. Frank Heimlich, Vice-President, American Association of Orthodontists.

9 A.M. ORTHODONTIC DOCTRINE AND MECHANICAL TREATMENT METHODS. C. Philip Adams (Ireland).

10 A.M. THE IMPORTANCE OF AN ACCURATE ANALYSIS IN ORTHODONTIC DIAGNOSIS AND TREATMENT PROCEDURES. Charles H. Tweed (U. S. A.).

11:30 A.M. First Business Meeting. Terrace Room.

12:15 P.M. Ladies' Luncheon and Style Show. Blue Room.

12:15 P.M. Past Presidents' Luncheon. Tamerlane Room.

1:30 P.M. RESEARCH SECTION, AMERICAN ASSOCIATION OF ORTHODONTISTS.

Honorary Presiding Officer: Francis A. Arnold, Jr., Chief, National Institute of Dental Research, Department of Health, Education and Welfare.

Presiding Chairman: Herbert I. Margolis, Chairman, Research Committee, American Association of Orthodontists.

1:30 P.M. Milo Hellman Research Award. Prize-Winning Essay.

2:15 P.M. Report of the Second Cephalometric Workshop. J. A. Salzmann, Chairman, Second Cephalometric Workshop Committee (U. S. A.).

3 P.M. Condensed Research Reports. (Ten-minute illustrated reports on current or recently completed research projects in orthodontics and associated fields. In addition to the usual fine reports by men in this country, there will be a number of contributions by our eminent guests from abroad—Karl Häupl, Germany; A. Martin Schwarz, Austria; Hugo Thörne, Sweden; R. B. Dockrell, Ireland; etc.)

Wednesday, April 27

SCIENTIFIC MEETING (Terrace Room, West Ballroom, and Bird Cage Walk)

Presiding Chairman: Nathan G. Gaston, Chairman, General Clinics Committee.

9 to 11:30 A.M. GENERAL CLINICS.

"Orthodontics at St. Louis University." St. Louis University, St. Louis, Missouri (John Cross, Theron Dikeman, Thomas Holden, Guillermo Mazzei, James Morrow, John Watkins, and K. C. Marshall, Director).

"The Community Orthodontic Clinic at St. Joseph's Hospital." Mason E. Seibel, Syracuse, New York.

"Early Treatment." L. W. Robinson, Youngstown, Ohio.

"Full Appliances in *One* Visit." John M. Jackson, Ardmore, Pennsylvania.

"Practice Administration." Herbert Paskow, Elizabeth, New Jersey.

"New Techniques in Orthodontics With the Use of Combination Loops." G. J. Broussard, Beaumont, Texas.

"The Spencer Atkinson Lingual Arch in Crossbite Cases." S. H. Yoffe, Harrisburg, Pennsylvania.

"Facial Photographs With a Polaroid Camera." B. F. Swain, Morristown, New Jersey.

"Class I or Pseudo Class III." E. O. Rosenast, Camden, New Jersey.

"Practice Management and Office Efficiency." Neal M. Roth, Jacksonville, Florida.

"Early Treatment Theory and Therapy. A Review of Ten Years of Treatment of Various Malocclusions With Appliances Specifically Developed for Use in Early Treatment." Abraham I. Fingeroth and M. M. Fingeroth, New Rochelle, New York.

"The Diamond Spring Arch." Jack Perlow, Flushing, New York.

"An Appliance Used in Treating Open Bite Cases." J. H. O'Hern, Philadelphia, Pennsylvania.

"Research on Headcap Treatment." Roger X. O'Meyer, Paris, France.

"Automatic Hawley." William E. Silver, Boston, Massachusetts.

"Direct Construction of Twin Wire Appliances in Sixty Minutes." Brooks Juett, Lexington, Kentucky.

"Adjuncts to Orthodontics." Albert Signorella, New Bedford, Massachusetts.

"Let Us Look at Habits and Their Control; Objective Motivation Suggestions." David J. Thompson, Elmhurst, Illinois.

"The Uses and Abuses of the Biteplate." T. L. Jerrold, Hempstead, Long Island, New York.

"Lip, Tongue and Thumb Habit Breakers." "Cuspid Retractors." "Make It Yourself Display Models." Max R. Kadesky, Dubuque, Iowa.

"The Importance of the Early Recognition of Missing Bicuspids With Some Treatment Ideas." Robert Gawley, Alhambra, California.

"Distal Movement of Molar Teeth With a Removable Appliance." Arthur Bell, Catonsville, Maryland.

"Variations of the Edgewise Mechano-Therapy." Solomon J. Kessler, Newark, New Jersey.

"Dynamic Functional Therapy." Harry W. Tepper, Los Angeles, California.

"Results of Orthodontic Treatment Five to Twenty-Five Years After." Abraham Lees, New York, New York.

"Distal Movement of Canines." Herman Livingstone, Dorchester Centre, Massachusetts.

"Some Factors in Orthodontic Relapses." Arthur L. Fern, Hartford, Connecticut.

"The Universal Appliance at Work." J. Clifford Willcox, Pasadena, California.

"Time Analysis in Orthodontic Practice." J. P. Garvey, Albany, New York.

"Use of the Gurin Lock in Labial, Twin Wire, Extra-Oral, and Edgewise Techniques." L. R. Gurin, Mount Kisco, New York.

"The Application of Electro-Surgery in an Orthodontic Practice." R. W. Galen, Cambridge, Massachusetts.

"Increasing the Area of the 'Milling Table,' as an Aid in Establishing New Neuro-Muscular Habit Patterns." George Orr, Jr., Lynchburg, Virginia.

"Stabilizing Plates for Anchorage." Bruce W. Higley, South Miami, Florida.

"Supernumerary and Congenitally Missing Teeth and Their Problems." Frank P. Gilley, Bangor, Maine.

"Aids in Retention." C. Paul Bonin, Boston, Massachusetts.

"Orthodontic and Prosthetic Management of the Cleft Palate Patient." Joseph Luban and Sebastian Bruno, Bronxville, New York.

"The Improved Edgewise Non-Tie Bracket; Its Use and Function." Louis J. Williams, Casper, Wyoming.

"Modified Indirect Technique Using Wax Collars." Walter J. Sly, Boston, Massachusetts.

"Universal Appliance and Some of Its Variations." Thorwald Eros, Jr., Atlanta, Georgia.

"Results of Treatment Obtained by Functional Orthopaedics of the Jaw." Karl Häupl, Düsseldorf, Germany.

"Active Removable Plates and Functional Appliances." Oscar Hoffer, Milan, Italy.

"A Demonstration of the Begg Technique." A Begg Study Group (Sidney Brandt, Morristown, New Jersey; Howard Diamond, New Brunswick, New Jersey; Willis Sage, Plainfield, New Jersey).

"Some Aspects of Permanent First Molar Removals." Sylvester J. Hecht, Red Bank, New Jersey.

"Extra-Oral Therapy." Robert L. DeShong, Oil City, Pennsylvania.

"Orthodontic Case Histories—A Synthesis of Factors in Diagnosis." Leonard Schlossberg, Bethesda, Maryland.

"Results of Removable Appliances." A. Martin Schwarz, Vienna, Austria.

"Orthodontic Management of the Cleft Palate Patient." John A. Cooper and Ross B. Long, Lancaster, Pennsylvania.

"A Simple Method of Producing Black and White Prints From 35 mm. Kodachrome Transparencies." Howard W. Peterson, Steubenville, Ohio.

"Analysis of Treated Orthodontic Cases." "Functional Jaw Orthopedics." William Grossman, London, England.

"Mixed Dentition Treatment for the Child With Cleft Palate." Lennard T. Swanson, Boston, Massachusetts.

"Variations of the Differential Light Force (Begg, Story, Smith) Technique According to Tweed Treatment Principles." Loyola University of Chicago, Orthodontic Department (Joseph R. Jarabak, Chairman, Staff and Graduate Students).

12 M. ROUND-TABLE DISCUSSION LUNCHEON (Blue Room and Palladian Room)

Presiding Chairman: B. Edwin Erikson, Vice-Chairman, 1960 Session.

Table No.	*Discussion Leader and Subject*
1.	A. Leon Ackerman, Westfield, New Jersey: Extra-Oral Anchorage.
2.	C. P. Adams, Belfast, Northern Ireland: Aims of Orthodontic Teaching.
3.	Philip E. Adams, Boston, Massachusetts: Labio-Lingual Applications and Variations.
4.	Ernest N. Bach, Toledo, Ohio: Distoclusion and Infraclusion.
5.	Walter R. Bedell, Poughkeepsie, New York: Gimmicks.
6.	Henry C. Beebe, Boston, Massachusetts: Referred Orthodontic Cases.
7.	P. Raymond Begg, Adelaide, South Australia: Optimal Orthodontic Forces.
8.	E. Allen Bishop, Seattle, Washington: Bi-Maxillary Extractions in Class II.
9.	Francis M. Calmes and Victor D. Bowles, Kansas City, Missouri: The Multiphase Philosophy and Technique.
10.	Edward A. Cheney, Lansing, Michigan: Dentofacial Asymmetries.
11.	Herbert K. Cooper, Lancaster, Pennsylvania: Oral-Facial and Speech Defects.
12.	Newton de Castro, Rio de Janeiro, Brazil: New Trends in Orthodontics.
13.	Gerard A. Devlin, Westfield, New Jersey: Vertical Relationship of Teeth and Dental Arches.
14.	B. F. Dewel, Evanston, Illinois: Mixed-Dentition Treatment.
15.	R. B. Dockrell, Dublin, Ireland: Specialist Orthodontic Training.
16.	H. Branin Jaggard, Camden, New Jersey: Case Analysis.
17.	Walter M. Dunlap, East Orange, New Jersey: Professional Ethics.
18.	M. D. Edwards, Montgomery, Alabama: The Transfer Patient.
19.	Meyer Eggnatz, Miami Beach, Florida: Patient Cooperation—Key to Success?
20.	Leigh C. Fairbank, Washington, D. C.: Orthodontic Payroll—Its Tax Problems.
21.	Samuel Fastlicht, Mexico, D. F.: Open-Bite Problems.
22.	G. Vernon Fisk, Toronto, Canada: Post-Treatment Relapse.

23. Robert James Gawley, Alhambra, California: Deciduous Molars Without Successors.
24. Clifford G. Glaser, Buffalo, New York: Training Functional Habits.
25. E. P. Harvold, Toronto, Canada: Arch Retention in Cleft Palate.
26. Robert B. Hedges, Jenkintown, Pennsylvania: Growth and Early Treatment.
27. L. B. Higley, Chapel Hill, North Carolina: Anchorage.
28. E. H. Hixon, Iowa City, Iowa: Size of Unerupted Cuspids and Bicuspids.
29. Scott T. Holmes, Muskegon, Michigan: Analytical Study of Diagnosis.
30. R. Hotz, Zurich, Switzerland: Class II, Div. 1 Treatment: Mandibular or Alveolar Response?
31. John H. Hovell, London, England: Malocclusion and T-M Joint Dysfunction.
32. Andrew Francis Jackson, Philadelphia, Pennsylvania: Basic Principles of Orthodontic Treatment.
33. John Mather Jackson, Ardmore, Pennsylvania: Modification of the Labio-Lingual Technique.
34. Charles S. Jonas, Atlantic City, New Jersey: The Lower Lingual Appliance.
35. Earl G. Jones, Columbus, Ohio: Orthodontic Treatment According to Age.
36. Solomon J. Kessler, Newark, New Jersey: Combining the Edgewise and Begg Techniques.
37. Birger Kjellgren, Stockholm, Sweden: Class III Malocclusion Treatment.
38. Gustav Korkhaus, Bonn, Germany: Can the Skeletal Pattern Be Changed?
39. William Kress, Baltimore, Maryland: Begg Light-Wire Technique.
40. S. James Krygier, Wilmington, Delaware: Begg Technique.
41. Hugo Lager, Copenhagen, Denmark: Tissue Reaction Due to Orthodontic Treatment.
42. Frank F. Lamons, Atlanta, Georgia: The Use of Crozat Removable Appliances.
43. John T. Lindquist, Indianapolis, Indiana: Indirect Appliance Construction.
44. Leo B. Lundergan, St. Louis, Missouri: Habits Affecting Occlusion.
45. Anders Lundström, Stockholm, Sweden: Indications and Contraindications for Orthodontic Treatment.
46. E. C. Lundsford, Miami, Florida: Transfer Patients.
47. Herbert I. Margolis, Boston, Massachusetts: Differential Diagnosis.
48. C. Edward Martinek, Detroit, Michigan: The Extraction Problem.
49. Dallas R. McCauley, Beverly Hills, California: Effects of Physiologic Forces on Orthodontic Therapy.
50. Hunter Irving Miller, Flint, Michigan: Saving and Investment Programs.
51. Alton W. Moore, Seattle, Washington: Extra-Oral Anchorage.
52. C. F. A. Moorrees, Boston, Massachusetts: Growth Changes of the Dentition.
53. Cecil G. Muller, Omaha, Nebraska: Removable Appliances Fabricated of Stainless Steel.
54. Frank W. Nash, Scranton, Pennsylvania: "Early" Treatment—What Form?
55. S. Lehman Nyce, Norristown, Pennsylvania: Loose Bands.
56. William H. Oliver, Nashville, Tennessee: The Occlusal Guide Plane.
57. Kyrle W. Preis, Baltimore, Maryland: Habits Affecting Dental Occlusion.
58. Samuel Pruzansky, Skokie, Illinois: Oblique and Other Cephalometric Projections.
59. Kaare Reitan, Oslo, Norway: Stabilization of Class II Cases.
60. John W. Richmond, Kansas City, Kansas: Transfer Patient Responsibilities.
61. Robert M. Ricketts, Pacific Palisades, California: The Influence of Orthodontics on Facial Growth.
62. Richard A. Riedel, Seattle, Washington: Mixed Dentition Treatment.
63. Emil O. Rosenast, Camden, New Jersey: Class I or Pseudo Class III?
64. Willis F. Sage, Plainfield, New Jersey: Maximum Tooth Movement—Minimum Force.
65. Raymond C. Sheridan, South Orange, New Jersey: Parent-Patient Relations.
66. W. B. Stevenson, Amarillo, Texas: Transfers and Good Public Relations.
67. Arnold E. Stoller, Seattle, Washington: Light-Force Therapy.
68. J. Daniel Subtelny, Rochester, New York: Cleft-Palate Orthodontics.
69. Boyd W. Tarpley, Birmingham, Alabama: The Treatment of Class II Malocclusion.
70. Raymond C. Thurow, Madison, Wisconsin: Improving Cephalometric Films.
71. Faustin N. Weber, Memphis, Tennessee: Serial Extraction Procedure.

72. Raymond L. Webster, Providence, Rhode Island: Appliance Therapy in Mixed Dentition.
73. Clifford L. Whitman, Hackensack, New Jersey: Habit Correction.
74. Wendell L. Wylie, San Francisco, California: Workings of the A.B.O.
75. Louis E. Yerkes, Allentown, Pennsylvania: Factors in Retention.

2:15 P.M. REGISTERED ATTENDANCE LECTURE-CLINICS, FIRST SESSION. (Room assignments will be made at the time of the meeting)

Presiding Chairman: Frank P. Bowyer, Chairman, Registered Attendance Clinics.

1. C. P. Adams, Ireland: Potentialities of Treatment With Removable Appliances.
2. Philip E. Adams, United States: Labio-Lingual Applications and Variations.
3. C. F. Ballard, England: An Analysis of Morphological Variation as a Basis for Treatment Planning.
4. P. Raymond Begg, Australia: The Light Arch-Wire Technique and Some Biological Problems.
5. Newton de Castro, Brazil: An Adequate Equalization of Class II Malocclusion.
6. George B. Crozat, United States: The Philosophy Underlying the Use of Removable Appliances.
7. R. B. Dockrell, Ireland: The Ideal Occlusion of the Teeth as a Diagnostic Aid.
8. Samuel Fastlicht, Mexico: Clinical Procedures in the Treatment of Impacted Cuspids.
9. Vernon Fisk, Canada: Management of Cases Having Congenitally Missing Teeth.
10. E. P. Harvold, Norway (Canada): Planning Orthodontic Cleft Palate Therapy.
11. Rudolph Hotz, Switzerland: Early Planned Extractions of Deciduous and Permanent Teeth as an Aid in Simplification of Orthodontic Treatment.
12. J. H. Hovell, England: Assessment of Soft Tissue Patterning Factors in the British Approach to Orthodontics.
13. S. J. Kloehn, United States: Analysis and Treatment of Class II Malocclusion With Cervical Anchorage.
14. B. S. Kjellgren, Sweden: Serial Extractions.
15. Gustav Korkhaus, Germany: Active and Passive Removable Appliances.
16. Hugo Lager, Denmark: Principles of Removable Appliance Therapy Related to Growth and Development.
17. Anders Lundström, Sweden: The Effect of Unilateral Hypoplasia and Asymmetry in Tooth Size on the Development of the Dental Arch.
18. Giorgio Maj, Italy: Cephalometric Approach to Diagnosis and Prognosis of Malocclusions.
19. C. E. Martinek, United States: Treatment Management.
20. Kaare Reitan, Norway: Consideration of Tissue Reaction in Treatment and Retention.
21. Robert Ricketts, United States: The Head X-Ray in Diagnosis and Treatment Planning.
22. J. H. Scott, Ireland: The Growth of the Human Face.
23. A. E. Stoller, United States: Philosophy and Application of Light Force Therapy.

3:45 P.M. REGISTERED ATTENDANCE LECTURE-CLINICS, SECOND SESSION.

Thursday, April 28

SCIENTIFIC MEETING (Terrace Room and West Ballroom)

Honorary Presiding Officers: Robert Y. Norton, President, Australian Society of Orthodontics, and Armando Werneck de Carvalho, Vice-President, Brazilian Society of Orthodontists.

Presiding Chairman: Kyrle W. Preis, President, Middle Atlantic Society of Orthodontists.

9 A.M. A FOUNDATION FOR CEPHALOMETRIC COMMUNICATION (Condensed A.B.O. Thesis). Robert M. Ricketts (U. S. A.).

9:30 A.M. THE CHALLENGE OF CLASS II MALOCCLUSION. Newton de Castro (Brazil).

10:30 A.M. LIGHT WIRE TECHNIQUE. P. Raymond Begg (Australia).

11:30 A.M. FINAL BUSINESS MEETING. Terrace Room.
ADJOURNMENT.

George M. Anderson, *President*
T. M. Graber, *General Chairman*
B. Edwin Erikson, *Vice-Chairman*
Paul V. Reid, *Program Chairman*
Paul Hoffman, *Local Arrangements Chairman*
Stephen C. Hopkins, Sr., *International Relations.*

A. A. O. Education Committee

It is acknowledged by many that the orthodontic specialty enjoys a high position of prestige and respect among the health professions. This position did not happen by chance but came after many years of sincere devotion to our profession and a continuing effort of study and sacrifice. The contribution that graduate programs in orthodontics have made to this total effort is only one of many, but it is one that needs further support if our future goals for an even better specialty are to be realized.

There are currently available numerous faculty positions for interested orthodontists who would like to engage in either full-time or part-time teaching activities. Many universities are now able to offer faculty positions with benefits which include not only attractive salaries but opportunities for travel, writing, and research.

The Education Committee would like to solicit your interest in such a teaching activity by having you write to the Chairman of the Education Committee (Dr. Edward J. Forrest, 808 South Wood St., Chicago 12, Illinois), stating whether you are interested in teaching orthodontics in graduate or undergraduate departments, and listing your educational qualifications, the school at which you would be interested in teaching, and the number of days or half days you would be willing to devote. This survey will be important in determining the interest of our specialty in supporting this most important teaching activity, one that is so essential to our further growth and development.

EDUCATION COMMITTEE
Robert E. Moyers
Boyd W. Tarpley
Edward J. Forrest, Chairman.

Northeastern Society of Orthodontists

The next annual meeting of the Northeastern Society of Orthodontists will be held at the Hotel Waldorf Astoria in New York, New York, March 13 to 15, 1960.

Pacific Coast Society of Orthodontists*

CENTRAL COMPONENT

The regular quarterly meeting of the Central Component, Pacific Coast Society of Orthodontists, was held at the Fraternity Club, San Francisco, on Tuesday, Dec. 8, 1959.

The afternoon session was devoted to a very enlightening paper by Dr. Harold T. Perry from Elgin, Illinois. His topic was "Functional Analysis in an Orthodontic Practice."

Following the cocktail and dinner hour, Dr. Perry answered questions regarding his paper. Then followed an introduction of our honored guest of the evening, Dr. Dallas McCauley of Los Angeles, who will be the next president of the American Association of Orthodontists. Dr. McCauley made some preliminary remarks about the next A. A. O. meeting, and discussed some of the functions and problems facing the A. A. O.

It was announced that the Golden Anniversary Committee of the A. A. O. wishes to locate all orthodontists who graduated in 1910 or prior to that date.

The meeting was closed by John Parker, who, during the course of the evening, had received the gavel from our outgoing chairman, Walter Straub.

SOUTHERN COMPONENT

The quarterly meeting was called to order, Dec. 4, 1959, by Chairman Howard Lang at the Statler Hotel in Los Angeles. After an introduction of guests, Chairman Lang brought to the attention of the members for their study the American Board case presentations of Ivan Lee of San Diego and Robert Ricketts of Pacific Palisades.

Cecil Steiner presented the speaker of the meeting—Arne Björk, Professor and Chairman of Orthodontics at the University of Copenhagen. During his presentation of both morning and afternoon, Dr. Björk covered many phases of orthodontics, including: (a) growth analysis of orthodontics; (b) importance of good x-rays and adequate landmarks; (c) the closed bite and its treatment; (d) the mechanism of normal and abnormal swallowing; (e) the development of the open-bite; (f) the development of the maxillary overjet; (g) the lips and tongue during speech; (h) growth possibilities of the maxilla; (i) the effect of compensating development; and (j) the value of removable appliances and their reasons for being successful when used. Preceding Dr. Björk's afternoon address, the business meeting was held. The minutes of the previous meeting were accepted as written.

NORTHERN COMPONENT

The regular meeting of the Northern Component, P. C. S. O., was conducted at the Sheraton-Portland Hotel, Portland, Oregon, Dec. 6 and 7, 1959.

Chairman Malcolm Chipman called the meeting to order at 9:30 A.M. on Dec. 6, 1959. He introduced Mr. Daniel Treloar, who provided information relating to the American Association of Orthodontists' Group Disability Insurance Program. This was done upon the recommendation of Association president, George M. Anderson. The meeting was then turned over to Program Chairman Denton Rees, who introduced guest speaker Harold Kesling of La Porte, Indiana.

Dr. Kesling used projected slides to demonstrate his application of the "Begg Light Arch Wire Technique." The "Begg Differential Force Principles" were discussed, and the application of those principles, aided by the use of new band attachments, was illustrated. The presentation was thoroughly enlightening and undoubtedly provided a stimulus for those in attendance to want to learn more of the mechanics and philosophy of the technique.

Following this, Frederick Crutcher read a paper entitled "Harmonious Anthropometric Relationships." Before the session adjourned that afternoon, Paul Klein presented a case report.

During the evening, members and their wives enjoyed cocktails and a dinner-dance at the Sheraton-Portland with guests, Dr. and Mrs. Harold Kesling.

At 9 A.M., December 7, a business meeting was conducted. The Secretary read the minutes of the previous meeting and gave a Treasurer's report. A telegram dated Dec. 3,

*Excerpts from the *Bulletin* of the Pacific Coast Society of Orthodontists.

1959, from A. A. O. Secretary Earl Shepard was read: "The solution to your question requires constitutional change. Suggest subject be brought up at next annual meeting." This was sent in response to a question raised at the previous meeting regarding the possibility of membership in the P. C. S. O. of men from Alberta, Canada.

Robert DeButts, chairman for the 1961 P. C. S. O. biannial meeting, reported that George McCulloch had been designated program chairman. It was moved and carried that the membership of the Northern Component back Dr. DeButts in the selection of the first few days of "Sea Fair" week in 1961 as the dates for that meeting, which will be hosted by the Northern Component in Seattle. "Sea Fair" usually occurs during the first week of August each year.

The election of officers for 1960 was conducted. Chairman-elect Denton Rees automatically assumed the component chairmanship for 1960. The offices of Chairman-elect, secretary-treasurer, and correspondent were given to Robert H. Kemp, John Raynes, and Rudolph Gothenquist, respectively. The latter two offices are of two years' duration.

The following papers were read:

Naso-Maxillary Proportional Constancy, Maurice Zingesser.

The Mechanics of Retention, James Wildman.

Eruption Movement of the Rat First Molar, Cyril O'Brien.

The program chairman was formally commended for having provided an unusually worthwhile series of speakers and clinicians. The meeting was adjourned at 12:30 P.M.

HAWAII SOCIETY OF ORTHODONTISTS

The Hawaii component met on Dec. 7, 1959, at the Evergreen Restaurant in Honolulu. President Robert Sample called the meeting to order at 5:30 P.M.

After a short business meeting, the program chairman turned the meeting over to George Uesato and Minoru Wakatake, who elaborated on the Tweed course which they recently took at Tucson, Arizona. Their presentations were most interesting and informative. Discussions of new techniques at the different courses are always well received by the members.

The following were elected to office for the coming year: *President,* Minoru Wakatake; *Secretary-Treasurer,* George Uesato. An announcement was made in respect to securing clinicians for the coming year. Members were instructed to write to any orthodontist who is tentatively traveling to Hawaii and who wishes to present a talk to our group and vacation at the same time. The meeting was adjourned at 9 P.M.

Southern Society of Orthodontists

The Southern Society of Orthodontists will hold its thirty-ninth annual meeting at the Grand Hotel in Point Clear, Alabama, June 26 to 30, 1960.

American Dental Association*

16TH CONGRESS ON DENTAL EDUCATION AND LICENSURE SET FOR FEB. 6

The 16th Congress on Dental Education and Licensure, sponsored by the Council on Dental Education, will be held Saturday, Feb. 6, at Conrad Hilton Hotel, Chicago. Theme of the all-day congress will be "the role of dental schools, licensure boards and dental societies in developing and maintaining high professional and ethical standards for dental practice." Chicago Dental Society's midwinter meeting will follow the congress on Feb. 7-10.

NIH AWARDS GRANTS FOR RESEARCH IN DENTAL ASPECTS OF AGING

National Institutes of Health has made 71 grants totaling $1,751,270 for research in various aspects of aging. Among these grants for new or continuing research are six worth

*Excerpts from the *A.D.A. News Letter,* Dec. 30, 1959.

$158,314 which are of direct interest to the dental profession. Dental grantees, amounts of grants, and titles of research are as follows: University of California, Berkeley, $8,986, comparative studies of aging in bones; University of Southern California, $11,048, investigation of the blood supply, lymphatic drainage and innervation of the teeth, periodontium and temporomandibular joint of the rat; Montefiore Hospital, Bronx, N. Y., $8,912, the human dental pulp-histological study; National Opinion Research Center, Chicago, $95,565, popular knowledge, attitudes, and behavior affecting dental health and care; New Mexico Department of Public Health, Santa Fe, $16,936, basic epidemiological survey of periodontal diseases; and Ruth M. Stewart Memorial Research Laboratory, West Palm Beach, Fla., $16,867, cytology of the adult odontoblast.

American Dental Association Announces Gift to Fund for Dental Education

Dr. Paul H. Jeserich, president of the American Dental Association and dean of University of Michigan School of Dentistry, recently announced that the American Dental Association is making a $50,000.00 contribution in support of dental education through the Fund for Dental Education. Speaking at a luncheon for leaders in the dental industry during the Greater New York Dental Meeting, Dr. Jeserich described the A.D.A. action in making this contribution as "an investment in the second century of progress and growth of organized dentistry in the U. S."

The grant, he explained, is to be divided between the Fund and the American Association of Dental Schools and used to advance programs of dental education with which they are charged.

"I firmly believe the promise of the dental profession lies in advancement and continuing improvement of its program for dental education," he said. Dr. Jeserich cited statistics which indicate that U. S. dental schools may have to double their present annual total of graduates by 1975 in order to maintain the present dentist-population ratio.

Speaking also on the same program, Dr. Maynard K. Hine, president of the Fund and dean of Indiana University Dental School, and Dr. Raymond J. Nagle, vice-president of the Fund and president-elect of the American Association of Dental Schools, called for a nationwide effort to encourage dental student recruitment. The freshmen classes of the nation's dental schools opened this fall with 130 vacancies. This is a serious thing for dentistry, they pointed out, because there will be 130 fewer practicing dentists four years from now when these classes are graduated. It is also serious for the dental industry because this shortage represents a loss in dental sales of more than a million dollars which would have been spent to set up and equip new dental offices. Dr. Nagle is also dean of New York University College of Dentistry.

American Dental Association Science Fairs: How to Participate

Your society's participation in the science fair movement can best be carried out through a special Science Fair Committee authorized to plan and put the program into action. Some societies delegate the job to existing Committees on Dental Education or Dental Health. After a committee has been given responsibility for science fair participation, the following steps are recommended for any program:

1. Ask the dean of the nearest dental school to designate scientific advisers. Make them members of the Science Fair Committee and arrange to work with them directly or by mail. Faculty members can suggest ideas and source material. In addition, they often can obtain equipment or supplies and may even arrange for students to use laboratory facilities under supervision.
2. Contact science teachers in the high school system through the office of the board of education or the principal. Establish liaison with the science fair director or other key person sparking science fairs in your community.

3. Put on a Dental Science Night for high school students and teachers. Set up table clinics. Have a speaker from the nearest dental school or research center. Distribute "Dental Projects for High School Science Students" and "Careers in Dentistry." Show the film, "Pattern of a Profession" (available from the A.D.A. Film Library).
4. Provide direct professional guidance to science teachers and students. (See list: "More Dental Science Topics.") Arrange tours of dental schools and other dental facilities for students and teachers.
5. Invite interested high school students and teachers to attend a scientific meeting of the local dental society, especially one which features research exhibits and clinics.
6. Persuade individual dentists, the dental society and allied dental groups to cooperate in local and regional science fairs and to contribute financial support to the science fair organization.
7. Publicize American Dental Association awards given annually at the National Science Fair.
8. Award special citations to those displaying dental science exhibits at local fairs. Write to Science Clubs of America (address below) for a list of award materials which it can furnish at nominal cost. Invite exhibitors of the best dental science projects to show their exhibits at district or state dental society meetings.
9. Serve as host or co-host for local and regional awards luncheon.
10. Encourage members of the dental society to give copies of "Dental Projects for High School Science Students" to high school age patients.
11. Encourage members of the dental society to attend the local and regional science fairs and to offer to serve as judges.
12. Publicize dentistry's participation in the science fair movement in all available media. This could take the form of a story announcing the formation of a Science Fair Committee; human interest feature stories on youngsters' projects; action news stories on cooperation from dentistry (such as the dentist who gathers in his basement workshop not only his own children but other young scientists for scientific meetings); what dental winners at last year's science fairs are going to do this year; the youngest (or very young) scientist and his project; guest appearances of young scientists on television and radio programs, and spot announcements in sustaining time or as a part of sponsored programs.
13. Arrange for a dental exhibit by a young scientist to be shown in a store window.

Detailed information about the operation of science fairs may be obtained free from Science Clubs of America, Science Service, 1719 N St., N. W., Washington 6, D. C.

Quantity lots of "Dental Projects for High School Science Students" are available to dentists, dental societies, and allied groups at special rates. Write to: Order Department, American Dental Association, 222 East Superior St., Chicago 11, Illinois.

An excellent guidebook called "Your Science Fair" by Welte, Dimond, and Friedl may be purchased at $3.75 a copy from Burgess Publishing Company, 426 South Sixth St., Minneapolis 15, Minnesota.

Swedish Dental Society

The year 1960 will mark the centennial of the Swedish Dental Society. The Society was founded in 1860 and is one of the oldest national dental organizations in the world. Its purpose is to promote the development and practical application of dental science.

The occasion will be celebrated by an International Centenary Congress to be held Aug. 17 to 20, 1960, under the patronage of His Majesty the King of Sweden.

The Congress will be held in Stockholm at the Concert Hall and at the recently built premises of the Swedish Dental Society, the Apollonia. A four-day scientific program will be arranged, covering all fields of odontology and comprising lectures, symposiums, panel discussions, and table clinics. Prominent researchers and clinicians from all parts of the world will participate. Special series of papers will be read in English by Swedish and other Scandinavian dentists. These papers are especially intended to give the visiting

colleagues some idea of the progress of Swedish and Scandinavian odontologic research and clinics and to show the present standard of odontology in the Scandinavian countries. One of these series will show how the public dental health service is arranged in Sweden.

A historical exhibition, including various objects and publications from the past century, will illustrate the scientific and technical development of odontology up to the present time. An international dental trade exhibition will also be arranged in connection with the Congress.

Apart from the purely scientific part of the program, excursions for study purposes as well as social gatherings will be arranged. The main event will be a Centenary Banquet in the Stockholm City Hall on August 20.

A sight-seeing program with visits to places of cultural and historical interest is being prepared for those accompanying the Congress participants.

A number of Swedish and Scandinavian travel bureaus, including the Swedish-American Line and SAS, offer their services in connection with arrangements for the trip to and from the Congress.

Further information about the Centenary Congress (hotel reservations, etc.) may be obtained from the Secretary of the Swedish Dental Society, Nybrogatan 53, Stockholm ö, Sweden.

Sixteenth Congress of ARPA Internationale

The sixteenth Congress of ARPA Internationale will be held Sept. 15 to 20, 1960, in the main building of Vienna University. The main theme of the Congress will be "Prostheses and Periodontal Diseases." There will be free discussions, as well as table clinics, concerning periodontal diseases and their relationship to the whole organism. At the same time there will be a medical exposition. The detailed program of the Congress will be available shortly.

Emory University

The Emory University School of Dentistry offers two twenty-four-month teaching fellowships in orthodontics, according to Dr. Frank F. Lamons, professor of orthodontics.

The Fellows engage in a twenty-four-month program of guided study, research, and practice which establishes a solid background for beginning the practice of the specialty, Dr. Lamons added.

Under the study program, the Fellows devote a minimal portion of their time to assistance in the teaching program in orthodontics, with major efforts being directed toward guided studies in gross anatomy and microanatomy, histology and pathology of the oral structures, growth and development, normal and abnormal occlusion, orthodontics, orthodontic technique, and clinical practice in orthodontics. In addition to these subjects, an intensive program in assigned reading and research is required; seminar sessions with members of the staff are held on a regular schedule.

The Fellows receive an annual stipend of $1,200.00. Appointments are made each year to begin on July 1 for the succeeding twenty-four-month period. Further information can be obtained from Dr. Frank F. Lamons, professor of orthodontics, Emory University School of Dentistry, 106 Forrest Ave., N. E., Atlanta 3, Georgia.

The General Fairbank Award

A pioneer orthodontist in the Army, Brigadier General Leigh C. Fairbank, DC (Ret.), established a medal bearing his name for the central officer with the highest scholastic standing in the Army Medical Service School's advanced officers' course. General Fairbank arrived at Brooke Army Medical Center on Dec. 18, 1959, to make the initial presentation.

General Fairbank is the first Dental Corps officer to attain general officer rank. He became Chief of the Army Dental Corps in 1938 and has been engaged in the private practice of orthodontics in Washington, D. C., since his retirement in 1942.

The medal and certificate are awarded to encourage young dental officers to participate in field medical service training. General Fairbank is depicted in profile on the face of the medal.

The citation reads: "In the year 1914 Leigh Cole Fairbank, D.D.S., entered the United States Army as a contract dental surgeon. He diligently and continually sought to bring more recognition to the Dental Corps as a significant and integral part of the Medical Service of the Army. His contributions added much to the advancement of the Dental Corps in the U. S. Army over a long period of time."

General Fairbank's first Army assignment was to the Old Station Hospital at Fort Sam Houston, which later became Brooke Army Hospital. His Army career was spent mostly here, at Fitzsimons Army Hospital in Denver, Colorado, at the U. S. Army Hospital at Fort Leavenworth, Kansas, and in Washington, D. C. His foreign service included duty in the Philippines and China.

In 1935 he was appointed Chief of the Dental Service at the U. S. Army General Dispensary in Washington, D. C. Following this he became Chief of the Army Dental Corps in 1938. In 1921 he was one of three Army dentists selected by the Surgeon General to attend the Dewey School of Orthodontia in New York City, and in 1938 he was the only Army dental officer to hold a certificate from the American Board of Orthodontics. He specialized in the application of orthodontic technique in the field of maxillofacial surgery.

General Fairbank is a member of the American Dental Association, the District of Columbia Dental Society, the Southern Society of Orthodontists (of which he is a past president), and the New York Academy of Dentistry. He is an honorary member of the Kansas State Dental Association, the First District Dental Society of Kansas, the Philadelphia Academy of Stomatology, and several foreign dental societies throughout Central and South America. He is a member of Omicron Kappa Upsilon and Delta Sigma Delta fraternities.

General and Mrs. Fairbank live in Fairfax County, Virginia. They have two married daughters. Their son, Leigh Cole Fairbank, Jr., a distinguished colonel in the Corps of Engineers, U. S. Army, died in 1959.

The dental profession, particularly the specialty of orthodontics, is very proud of the record made by General Fairbank, who was one of the very first to introduce orthodontics in the U. S. Army as a part of the Army Dental Service.

Notes of Interest

Velma P. Brown, D.D.S., M.S., announces the removal of her office to 8505 Delmar Blvd., University City, Missouri, practice limited to orthodontics.

Lowell T. Oldham, D.D.S., M.S., is pleased to announce the association of Robert E. Moen, D.D.S., in the practice of orthodontics, 303-10 Brick and Tile Bldg., Mason City, Iowa.

Dr. Jack Perlow announces the removal of his Brooklyn office to 7000 Bay Parkway, Brooklyn, New York, practice limited to orthodontics.

Robert P. Posner, D.D.S., announces the removal of his office to 108-58 Queens Blvd., Forest Hills, New York, practice limited to orthodontics.

Forthcoming meetings of the American Association of Orthodontists:
1960—Shoreham Hotel, Washington, D. C., April 24 to 28.
1961—Denver Hilton Hotel, Denver, Colorado, April 16 to 21.
1962—Statler Hotel, Los Angeles, California, April 28 to May 3.
1963—Americana Hotel, Miami Beach, Florida, April 28 to May 2.

OFFICERS OF ORTHODONTIC SOCIETIES

The AMERICAN JOURNAL OF ORTHODONTICS is the official publication of the American Association of Orthodontists and its component societies. The Editorial Board of the JOURNAL is composed of a representative of each of the component societies.

American Association of Orthodontists
(Next meeting April 24-28, 1960, Washington)

President, George M. Anderson - - - - - - - - - - - - - 3700 N. Charles St., Baltimore Md.
President-Elect, William R. Humphrey - - - - - - - - - - - Republic Bldg., Denver, Colo.
Vice-President, Frank A. Heimlich - - - - - - - - 1824 State St., Santa Barbara, Calif.
Secretary, Earl E. Shepard - - - - - - - - - - - 225 South Meramec, Clayton, Mo.

Central Section of the American Association of Orthodontists
(Next meeting Sept. 18-20, 1960, St. Louis)

President, Leo B. Lundergan - - - - - - - - - - 8000 Bonhomme Ave., St. Louis, Mo.
Secretary-Treasurer, Kenneth E. Holland - - - - - - 1019 Sharp Bldg., Lincoln, Neb.
Director, Elmer F. Bay - - - - - - - - - - - 216 Medical Arts Bldg., Omaha, Neb.

Great Lakes Society of Orthodontists
(Next meeting Nov. 27-30, 1960, Cincinnati)

President, Hunter I. Miller - - - - - - - - - - - 1416 Mott Foundation Bldg., Flint, Mich.
Secretary, Edward A. Cheney - - - - - - - - - - 1201 Bank of Lansing B'dg., Lansing, Mich.
Director, Harlow L. Shehan - - - - - - - 601 Jackson City Bank Bldg., Jackson, Mich.

Middle Atlantic Society of Orthodontists

President, Kyrle W. Preis - - - - - - - - - - - 700 Cathedral St., Baltimore, Md.
Secretary-Treasurer, Charles S. Jonas - - - - - - Mayfair Apts., Atlantic City, N. J.
Director, Louis E. Yerkes - - - - - - - - - - - 825 Linden Ave., Allentown, Pa.

Northeastern Society of Orthodontists
(Next meeting March 13-15, 1960, New York)

President, Wilbur J. Prezzano - - - - - - - - Medical Centre, White Plains, N. Y.
Secretary-Treasurer, David Mossberg - - - - - - 36 Central Park S., New York, N. Y.
Director, Norman L. Hillyer - - - - - - - 230 Hilton Ave., Hempstead, L. I., N. Y.

Pacific Coast Society of Orthodontists
(Next meeting Feb. 21-24, 1960, Palo Alto)

President, Richard Railsback - - - - - - - - - 1333 Grand Ave., Piedmont, Calif.
Secretary-Treasurer, Warren Kitchen - - - - - - 2037 Irving St., San Francisco, Calif.
Director, Richard Railsback - - - - - - - - - - 1333 Grand Ave., Piedmont, Calif.

Rocky Mountain Society of Orthodontists
(Next meeting Sept. 25-28, 1960, Santa Fe)

President, William A. Blueher - - - - - - - - - 801 Encino Pl., Albuquerque, N. M.
Secretary-Treasurer, E. H. Mullinax - - - - - - - 8790 W. Colfax, Lakewood, Colo.
Director, Ernest T. Klein - - - - - - - - - - - 707 Republic Bldg., Denver, Colo.

Southern Society of Orthodontists

President, M. D. Edwards - - - - - - - - - - - - - - - 132 Adams St., Montgomery. Ala.
Secretary-Treasurer, William H. Oliver - - - - - - - 1915 Broadway, Nashville, Tenn.
Director, Boyd W. Tarpley - - - - - - - 2118 Fourteenth Ave., S., Birmingham, Ala.

Southwestern Society of Orthodontists
(Next meeting Sept. 25-28, 1960, Kansas City, Kan.)

President, John W. Richmond - - - - - - - 493 Brotherhood Bldg., Kansas City, Kan.
Secretary-Treasurer, Tom M. Matthews - - - - - - 8215 Westchester Dr., Dallas, Texas
Director, Nathan Gaston - - - - - - - - - - - - 701 Walnut St., Monroe, La.

American Board of Orthodontics
(Next meeting April 18-23, 1960, Washington)

President, L. Bodine Higley - - - - University of North Carolina, Chapel Hill, N. C.
Vice-President, Jacob A. Salzmann - - - - - - - 654 Madison Ave., New York, N. Y.
Secretary, Wendell L. Wylie - - - - - University of California School of Dentistry, The Medical Center, San Francisco, Calif.
Treasurer, Paul V. Reid - - - - - - - - 1501 Medical Arts Bldg., Philadelphia, Pa.
Director, B. F. Dewel - - - - - - - - - - - - - 708 Church St., Evanston, Ill.
Director, Frank P. Bowyer - - - - - - - - 608 Medical Arts Bldg., Knoxville, Tenn.
Director, Alton W. Moore - University of Washington School of Dentistry, Seattle, Wash.